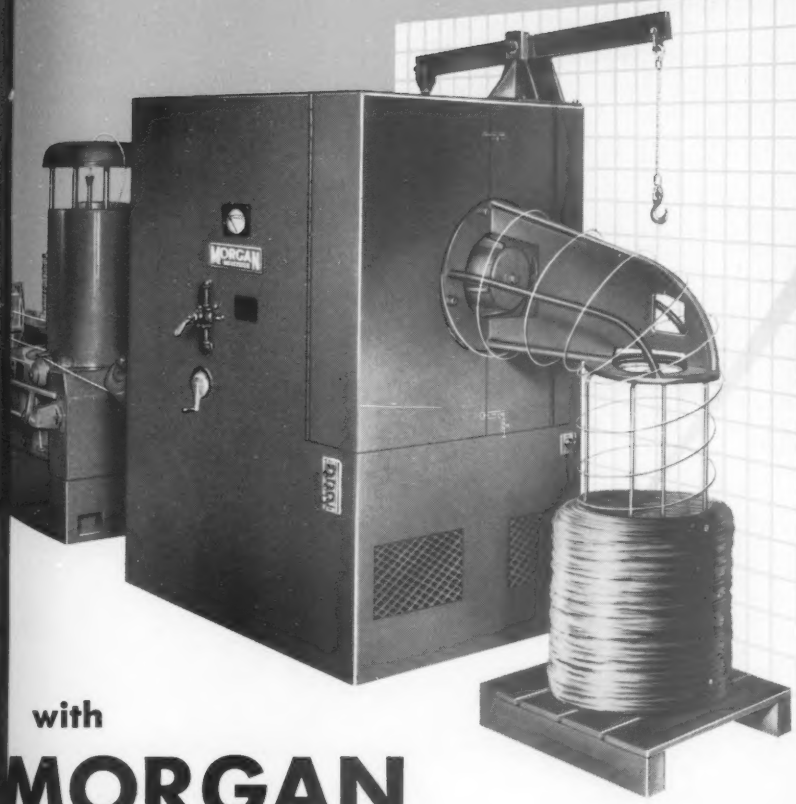
WIRE AND WIRE PRODUCTS

AUGUST 1960



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WM 123

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

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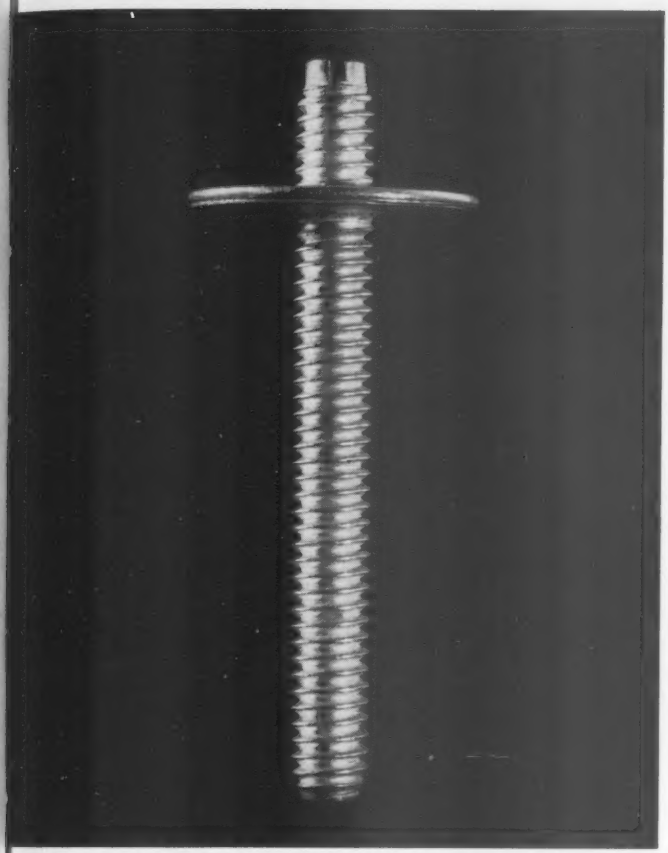
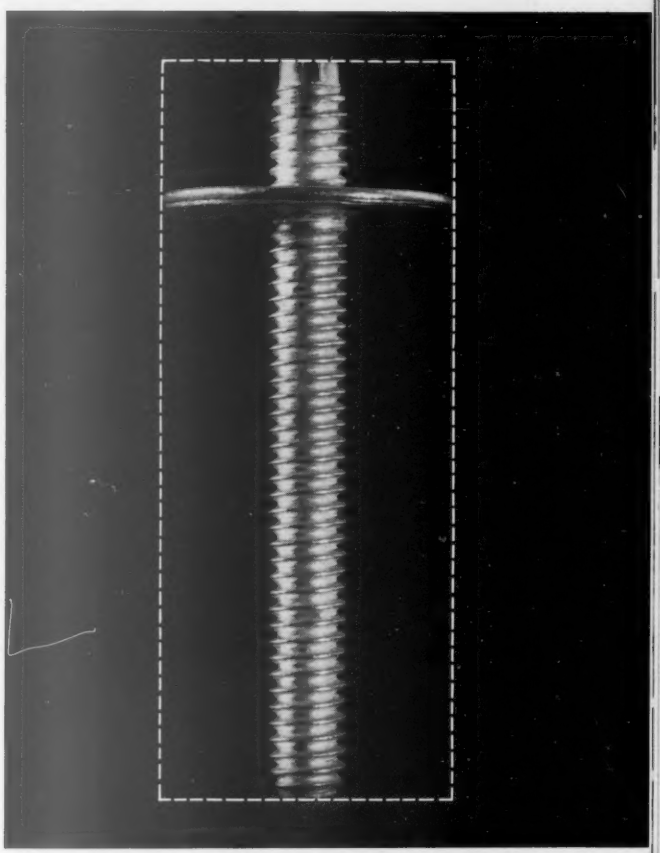
CANTON, MASSACHUSETTS

This "impossible" screw is now being cold-headed



Now cold-headed from steel wire at one-tenth the cost.



Machined from bars, 91 pct of the steel is wasted.

This automobile window-adjusting channel screw is being produced from cold-heading wire at one-tenth the original cost. Formerly machined from bar stock with a 91 per cent waste, this special screw is upset to three-and-one-half times the diameter of its shaft.

Bethlehem Steel has played a vital role in the progress of cold-heading by supplying steel wire in the proper grades and analyses, and by recommending the correct heat-treatment.

You may now be machining parts that can be cold-headed, at less cost—and with improved properties. By no means do we say that we can supply cold-heading wire for every one of them. But our experienced metallurgists have helped many users of cold-heading wire to improve their results. Perhaps they can do the same for you. Our nearest sales office will welcome the chance to talk it over. Or get in touch with us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Distributor:* Bethlehem Steel Export Corporation

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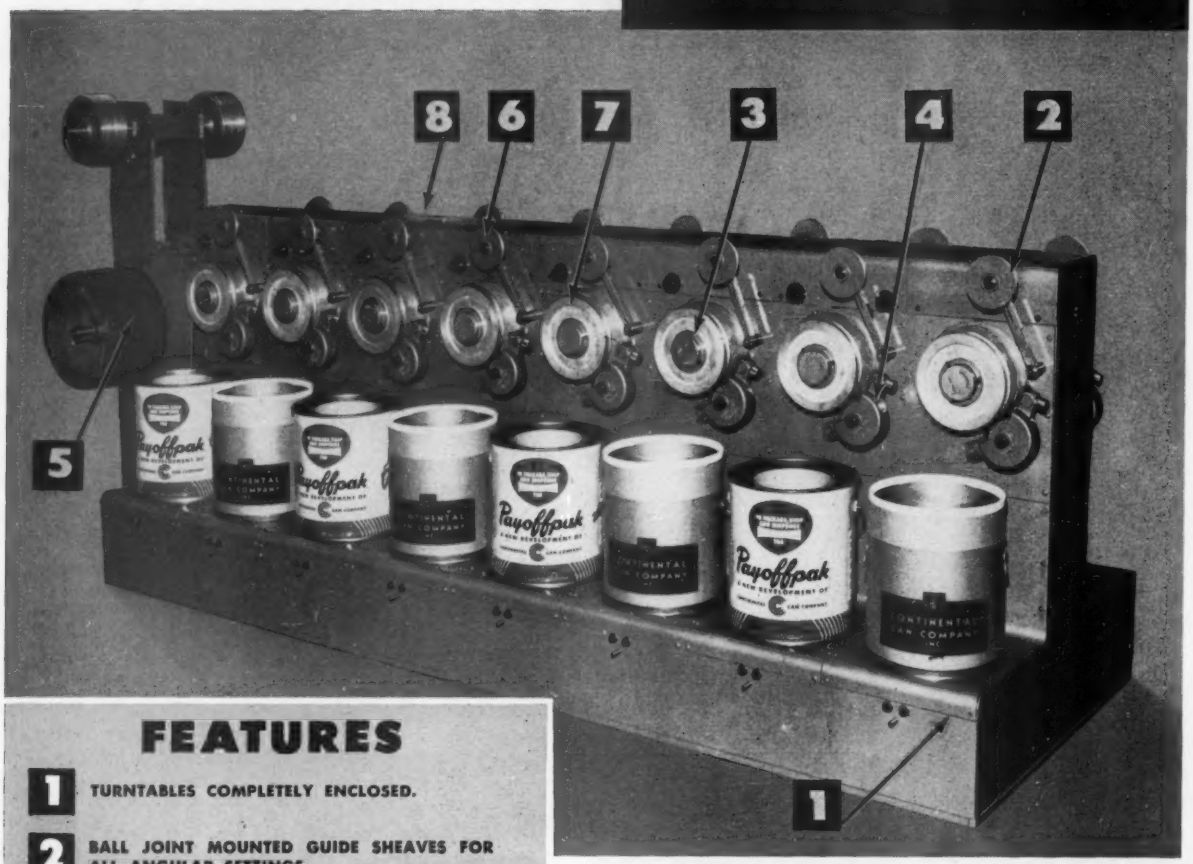

FEATURES

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2. BALL JOINT MOUNTED GUIDE SHEAVES FOR ALL ANGULAR SETTINGS.
3. ELECTRO-MECHANICAL TENSION CONTROL FOR EACH HEAD.
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5. PRIME RUBBER LAGGED CAPSTAN.
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7. ALUMINUM CAPSTANS, WITH HARD-ANODIZED, POLISHED RUNNING SURFACES.
8. INDIVIDUAL MAINTENANCE ON EACH SECTION.

The drum packaging Take-Up System illustrated, Model S5-TC-S, was designed especially for Magnet Wire.

Other models are made for all types of ferrous and non-ferrous wires.

Advanced engineering and precision construction have evolved in this machine new concepts of speed and efficiency in the packaging of wire. Capacity: Min. size — #32 ga.; max. size — #20 ga. wire.

YOU ARE INVITED TO SECURE COMPLETE DETAILS REGARDING THIS ADVANCED PROCESS FROM —

Advanced Wyrepak Co., Inc.

11 HARRISON COURT PHONE: EDison 4-4274 BRIDGEPORT, CONN.

OR The Vaughn Machinery Co., CUYAHOGA FALLS, OHIO

WIRE AND WIRE PRODUCTS*

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 35 August, 1960 No. 8

Designated as Official Publication By The Wire Association

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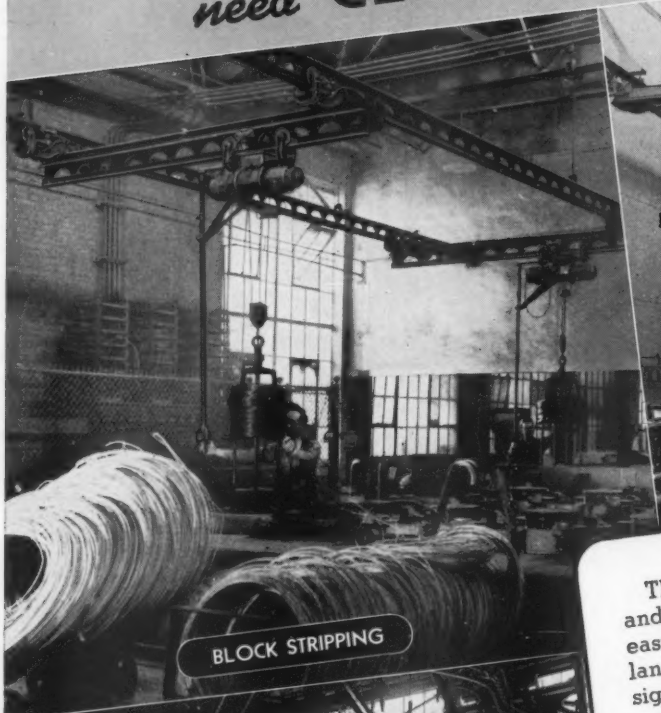
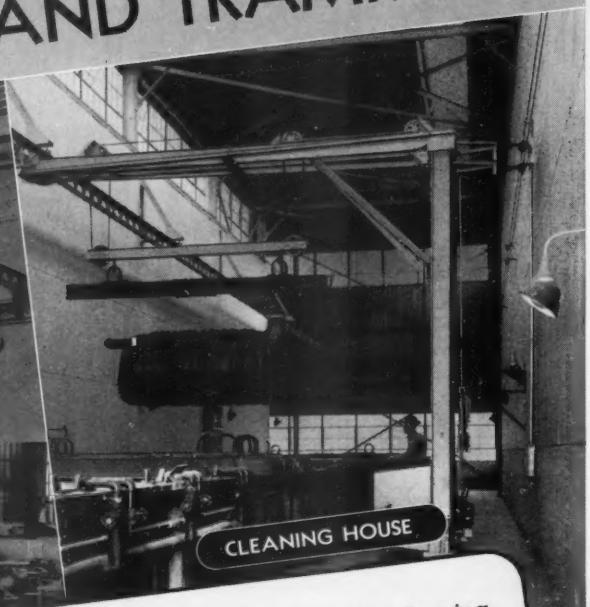
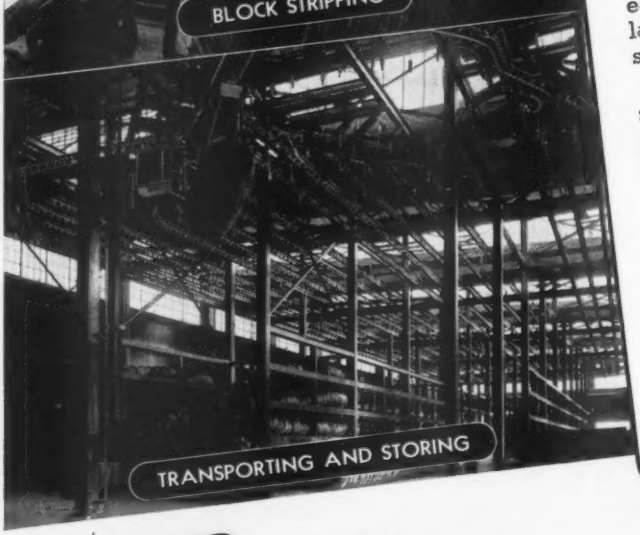
96 Years of Cutting Wire and Costs

ROD AND WIRE PLANTS *need* CLEVELAND TRAMRAIL







The hard work in the cleaning, drawing and handling of wire and rod has been made easy, fast and safe by application of Cleveland Tramrail equipment especially designed for the work.

Perhaps no other single factor has been so influential in increasing production and lowering costs in the wire or rod mill as properly designed and applied overhead materials handling equipment.

Today more producers and fabricators of wire and rod are enjoying the many advantages of Cleveland Tramrail than ever before and the list of prominent names in this industry is growing rapidly.

It costs you nothing to learn what Cleveland Tramrail can do for you, but it may be of tremendous importance in the immediate years ahead. Why not investigate now?

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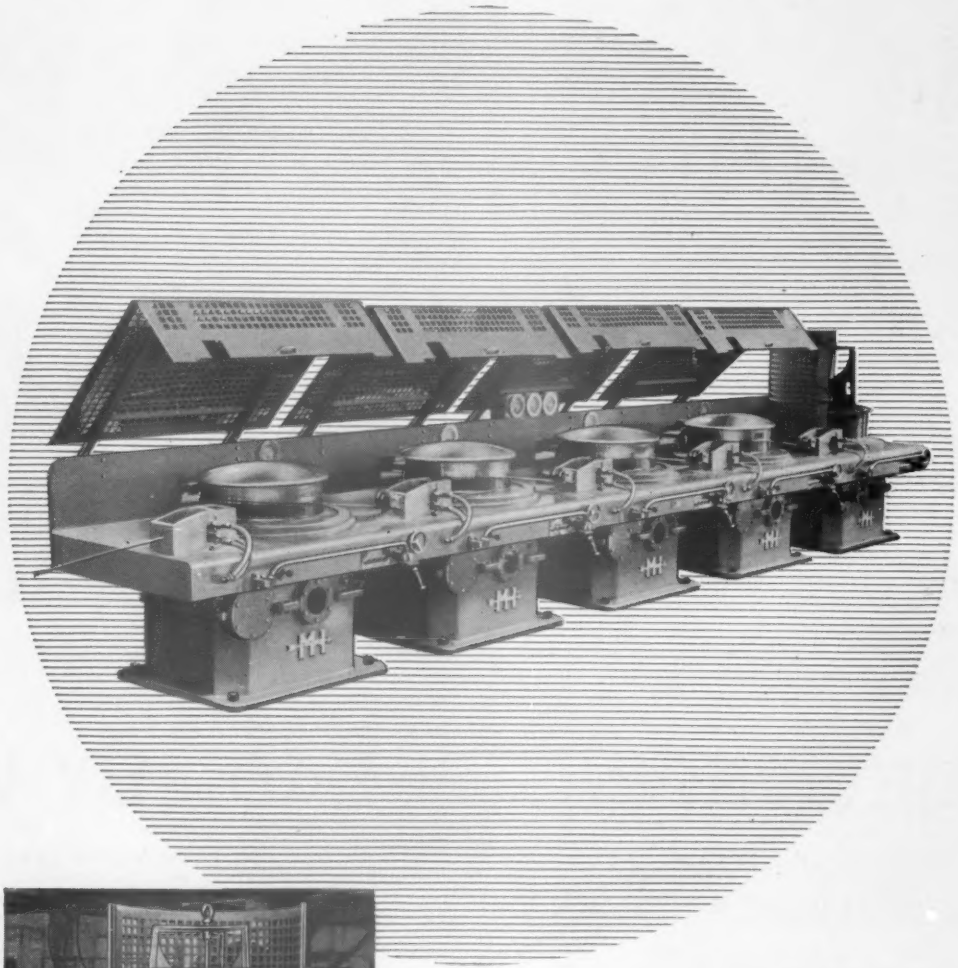
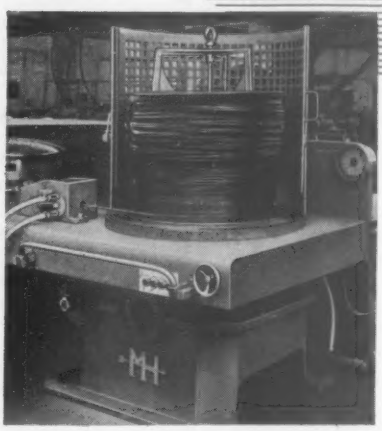
PRECISION WITH RUGGEDNESS



The heavy size:
BEELINE DG-5
with five 28" blocks
for
PRESTRESSED
CONCRETE WIRE
max. about
.55" rod.



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. . . Stacks of Nestaway racks show nesting, interlocking and space-saving features of racks for baked goods handling made by Mid-West Metallic Products for its affiliate, Nestaway, Inc. Rack held by Harold W. Vetter (left), Mid-West director of manufacturing, and Robert J. Adams, purchasing agent, holds 12 loaves of bread and stacks 12 high on castered base. Rack uses up to 13.3 pounds of Pittsburgh Steel Co.'s bright basic wire.

DELIVERING BREAD—BY WIRE

Pittsburgh Steel wire's uniform welding, forming properties give Mid-West Metallic extraordinary success in the manufacture of Nestaway racks

Bread and pastries are delivered better by wire. That is, by welded steel wire racks that perform double duty in handling and selling baked goods.

Mid-West Metallic Products, Inc., a fast-growing subsidiary of Rubbermaid, Inc., uses Pittsburgh Steel Company's bright basic wire to build wire shipping racks for its affiliate, Nestaway, Inc., another Rubbermaid subsidiary. In addition to the Nestaway racks, Mid-West makes more than 300 other wire formed products, using Pittsburgh Steel's bright basic and galvanized wire in a wide range of sizes.

The Nestaway racks, however, are a prime example of Mid-West's experience in using Pittsburgh Steel's .3625 and .3065 bright basic wire.

The racks are part of a complete Nestaway system for baked goods handling to and at the point of sale. The system includes interlocking wire racks, rack shelves and caster bases. It eliminates nearly all direct handling of baked goods between bakery and consumer.

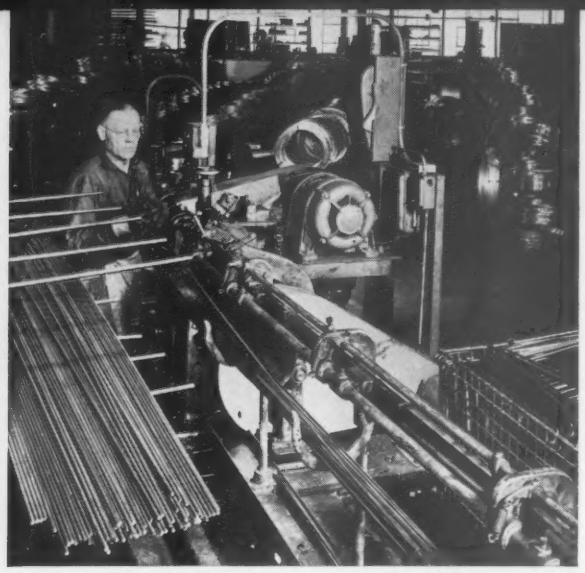
To build the Nestaway racks, Mid-West uses automated and semi-automated forming and welding equipment of its own design. This equipment requires wire with the highest possible uniform physical properties. Mid-West depends on Pittsburgh Steel for much of its wire supply because it is assured consistent, uniform quality.

• **Phenomenal Welding Success** —Made in 11 sizes ranging from 8.4 to 13.3 pounds in weight, an average Nestaway rack requires 200 welds.

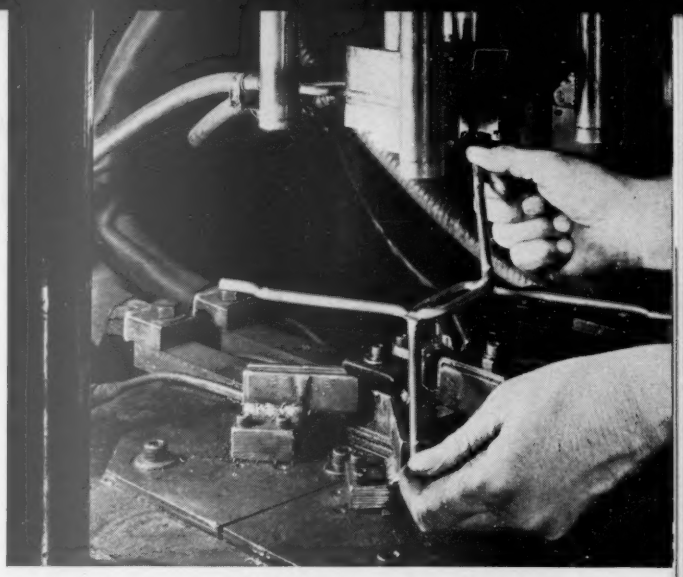
On welding, Harold W. Vetter, Mid-West's director of manufacturing, says:

"In all of our production last year, we had an extraordinarily low number of broken welds. We've had racks returned that had been accidentally crushed by trucks—but the welds were seldom broken."

Purchasing Agent Robert J. Adams adds further evidence of the



. . . From straightening and cutting through final copper-nickel-hard chrome plating, Pittsburgh Steel's wire meets Mid-West Metallic's requirements for consistent uniformity of forming, welding, coating properties.



. . . Key piece of rugged Nestaway rack—the bends and welds on "X"-shaped side supports are produced to tolerances of plus/minus .015 inch by Mid-West Metallic with Pittsburgh Steel's .3625 bright basic wire.

weldability of Pittsburgh Steel's bright basic wire, saying:

"We found Pittsburgh Steel wire would consistently hold welds when we bend the welded ends of the rack's bottom frame to form Nestaway's interlocking feature."

• **Close Forming Tolerances**—Because Nestaway racks are built to stack when loaded and nest precisely when empty, wire bends are made to unusually close tolerances. Mr. Vetter explains:

"This rack is so accurately formed that it's practically a machined product. Every bend—even over-all dimensions and some welds—is held to a tolerance of .015 inch."

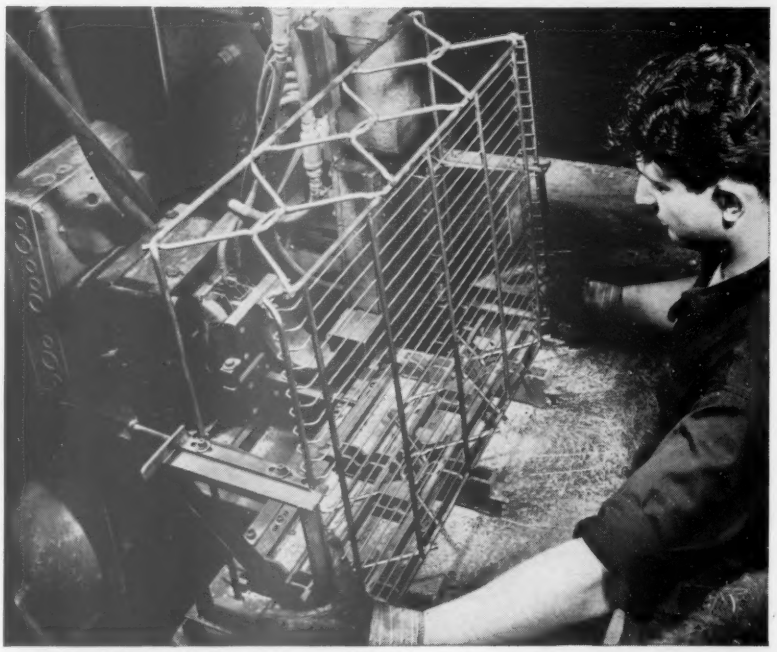
Surface finish of Pittsburgh Steel's wire is vital, too. After assembly, the rack is given a copper-nickel-hard chrome coating to provide a durable, attractive unit which meets strict standards of cleanliness.

Pittsburgh Steel's ability to supply wire with the consistent quality Mid-West Metallic requires is testified to by Purchasing Agent Adams. He says:

"Pittsburgh Steel furnishes us quality wire with uniform properties from shipment to shipment. Otherwise, we're in trouble on our automatic machines. We want wire that is weldable, formable and clean.

"Pittsburgh Steel has been able to give us what we want with consistency and we're extremely satisfied with the way its wire performs for us."

Take a lesson from Mid-West Metallic's experience. The benefits this progressive company gets from using Pittsburgh Steel's wire can be yours, too, whatever your application. Just contact one of the district offices listed at the right.



. . . With 200 welds per rack and a present capacity of more than 25,000 Nestaway racks per month plus component parts of the Nestaway System, Mid-West Metallic experiences very few broken welds in the course of a year. Credit goes to efficient equipment and wire quality. Nestaway rack is shown here in assembly before chrome plating. Mid-West, a subsidiary of Rubbermaid, Inc., looks to Pittsburgh Steel for bright basic wire and plain galvanized wire to make Nestaway racks and more than 300 other products at the new Cleveland, Ohio, plant.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

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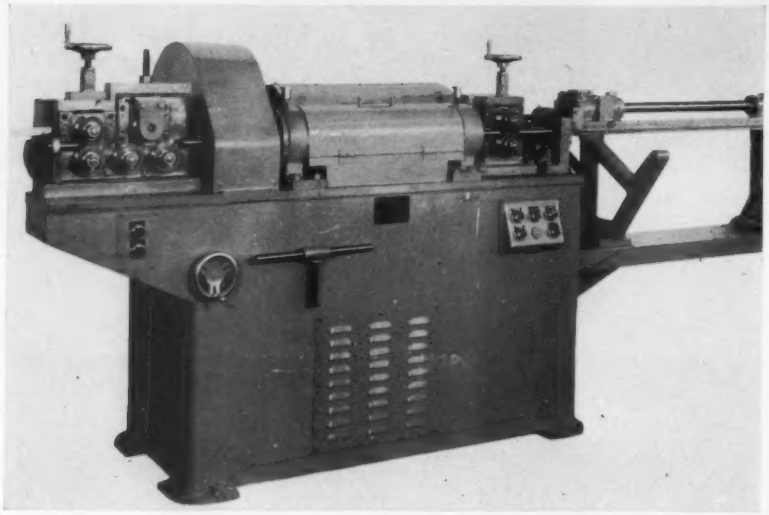
Steel

If you use wire up to 3/8", this new SHUSTER is just for you!



SINCE 1866

These new SHUSTER wire straightening and cutting machines incorporate new advantages to give you higher production—for less cost. The 2ABV variable speed unit straightens and cuts round wire from 5/32" to 3/8"; the 2ABVF straightens and cuts shape stock up to 1/4" square.

The new machines include an improved, vertical drive 5-roll gear driven preliminary straightening unit, and feed roll housing, both Timken bearing equipped. The new SHUSTER'S can automatically cut lengths up to 14" at the rate of 140 pieces per minute, and provide infinite variable speed within all feed and cutoff ranges. This machine may also be purchased as a constant speed unit (150 f.p.m.).

Want more details? Send this coupon today!

Gentlemen:

☐ Please send me complete specifications and prices on the 2ABV-2ABVF SHUSTER.

☐ Send me specifications and prices to meet the following wire straightening requirements: .....

.....

Name .....

Address .....

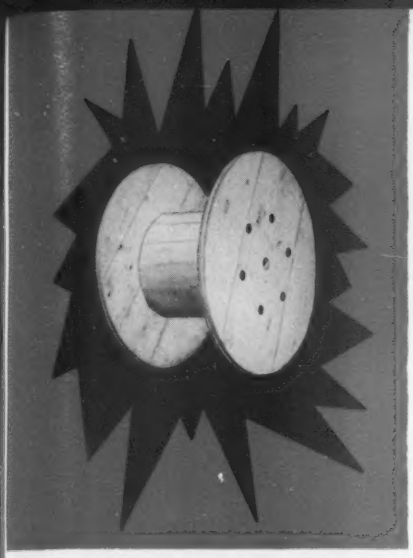
City ..... *State* .....

SHUSTER FEATURES:

1. Higher speed five die straightening arbor, mounted on ball bearings for minimum vibration.
2. Electric trip mechanism on target.
3. Solenoid-operated roll-type clutch.
4. Electric control Panels— two position operation.
5. Totally enclosed feed roll housing and prestraightener with shafts mounted on Timken Bearings. Gears in oil.
6. Electric Brake on clutch shaft.
7. Wide range Reeves Variable Speed. 50 to 200 F.P.M.
8. Wire size range: 5/32" to 3/8" diameter basic wire.
9. Gear driven preliminary 5 roll straightener, mounted in vertical position.

METTLER MACHINE TOOL, INC.

155 W. Adeline Street • New Haven, Connecticut

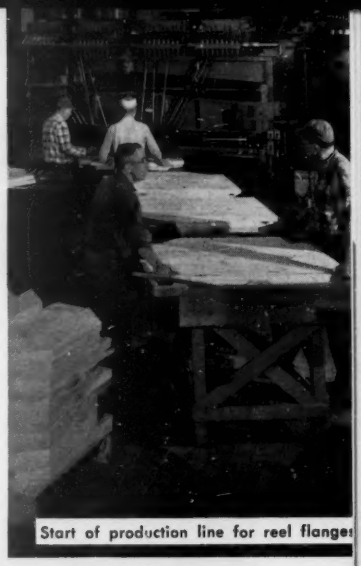


YOU SAVE WITH NON-RETURNABLES

BRIDGE REELS, through manufacturing techniques that have been continuously improved and streamlined, have become pre-eminently the standard for quality and dependability.

Look at these Advantages:

- Reduced Reel Investment
- Less Storage Space
- Lower Freight Costs
- No Return Freight Charges
- No Bookkeeping
- No Repair Costs
- No Deposits Needed
- No More Headaches! !



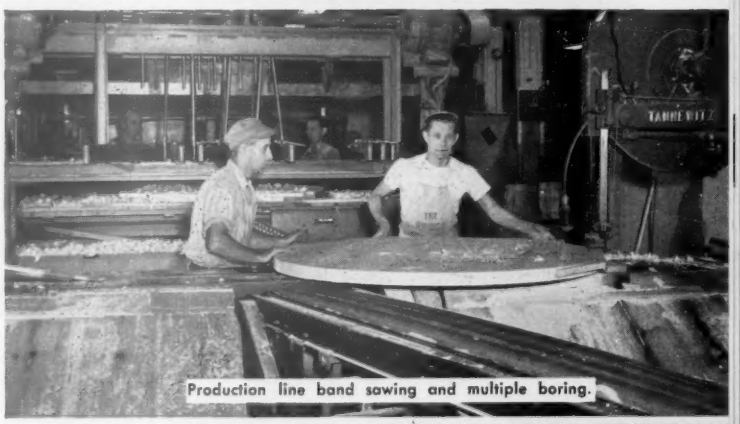
Start of production line for reel flanges

Why BRIDGE REELS are Tops:

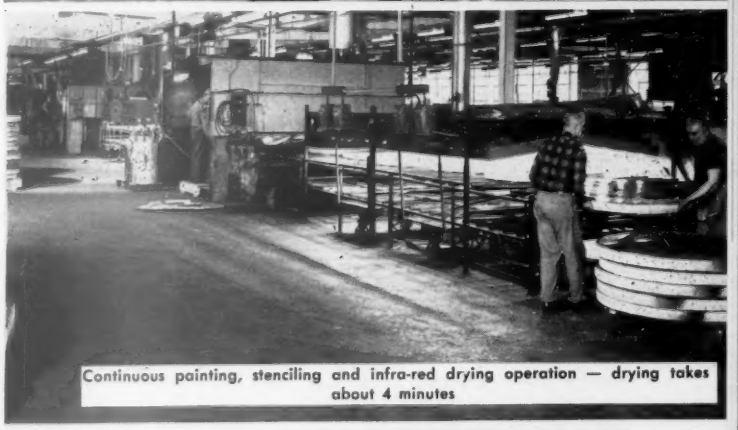
- Lumber Kiln Dried at Plant
- Latest and Finest Reel Manufacturing machines —many made to Bridge Special Specifications
- Fabricating methods continuously improved
- Fast, Efficient Straight-Line Flow of Production Work
- Painting and Stenciling Completed in approximately 4 Minutes
- Reel Assemblies made with many unique Mechanical Innovations
- Shipping and Delivery Facilities Unequaled

NON-RETURNABLE

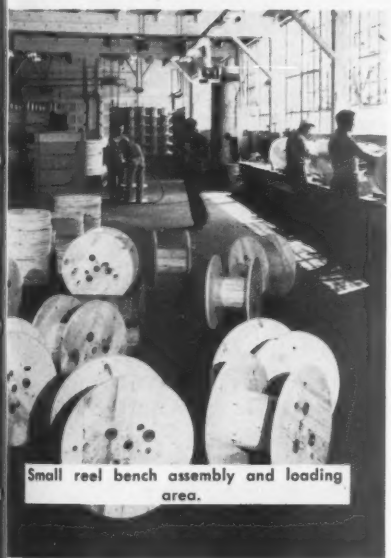
WOOD REELS IN ALL SIZES FOR ALL TYPES OF ELECTRIC WIRE AND CABLE



Production line band sawing and multiple boring.



Continuous painting, stenciling and infra-red drying operation — drying takes about 4 minutes



Small reel bench assembly and loading area.

NON-RETURNABLE REELS GIVE YOU A DEFINITE PACKAGING COST

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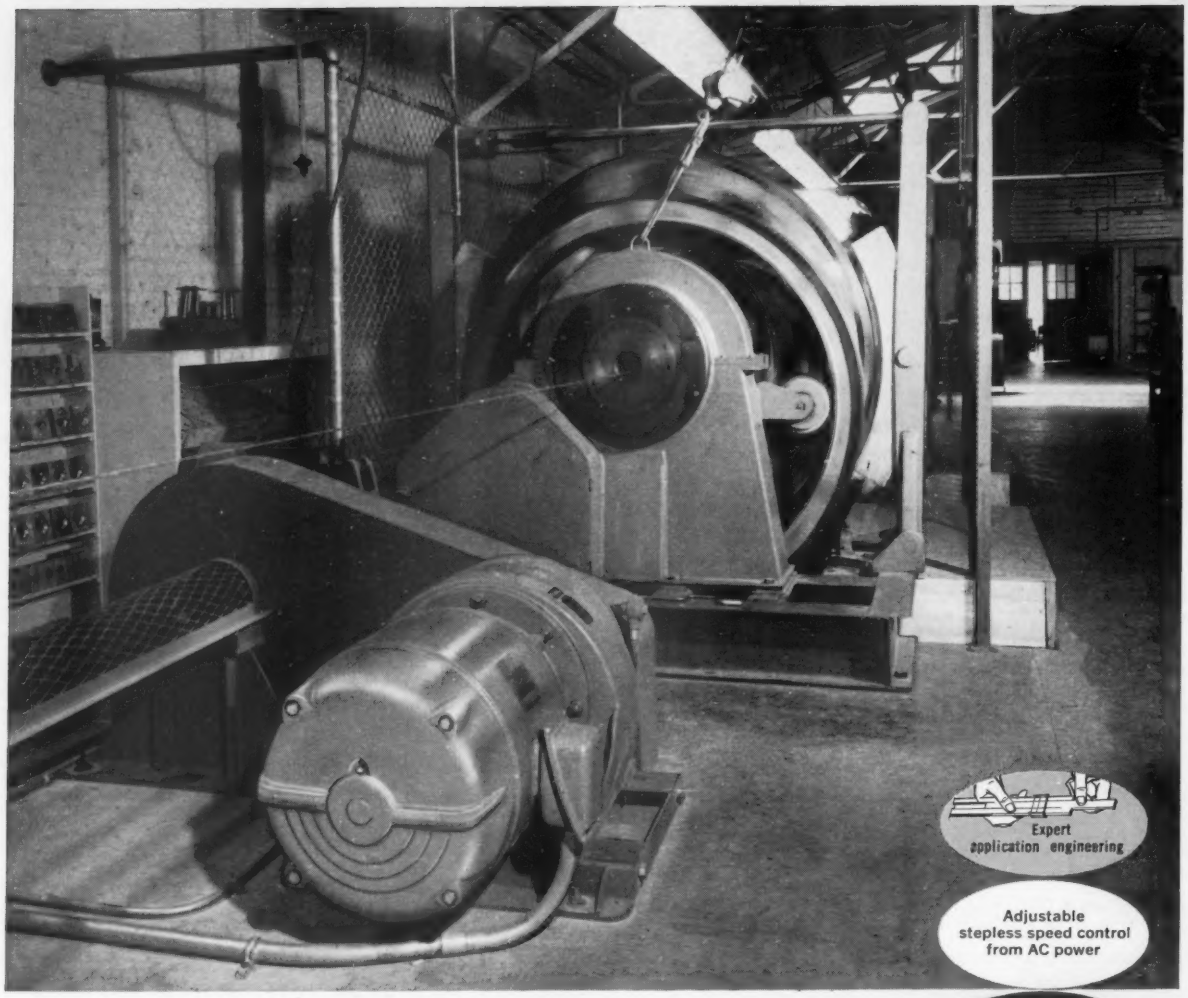
Let us quote on your Reel needs. Send in your specifications. Better yet, visit our plant and see how Reels are made so well at so low a cost.

WOOD REELS

HIGH-SPEED SHIPPING SERVICE IN OUR OWN TRUCKS WITHIN A RADIUS OF 250 MILES OF THE PLANT, FAST FREIGHT WILL BRING YOU BRIDGE REELS WITHIN A FEW DAYS TO POINTS EAST OF THE MISSISSIPPI

TEL: THOMPSONVILLE, CONN.



Stepless speed control provides the right twist for cabler

Louis Allis Ajusto-Spede® Drive automatically adjusts speed and/or tension for twisting fine strands into multi-conductor cable

Significant product improvement can be made in cable production if your cablers and other wire processing equipment are equipped with Louis Allis Ajusto-Spede drives and control, like the 50 hp unit shown above.

Here's how it works: You just select the speed you want, and the Ajusto-Spede delivers it steplessly. The drive glides into top speed because acceleration is precisely controlled at all times. The result: proper tension on wires for high-speed cable production with a minimum of strand breakage, downtime, and waste.

The Louis Allis Ajusto-Spede Drive can bring you the same benefits wherever you need precise control of adjustable speed and/or tension to make or process wire. Other applications include wire drawing machines, stranders, extruders, capstans, wind-ups, etc.

Let Louis Allis tailor the Ajusto-Spede drive for one machine — or to provide precise "one dial" master speed control for a multi-drive system. Sizes from 1 to 100 hp, with a broad range of electrical and mechanical modifications to meet your needs.

Contact your nearby Louis Allis District Office for further information and application help, or write for Bulletins 2750 and 2800 to the Louis Allis Company, 451 East Stewart Street, Milwaukee 1, Wisconsin.

® A registered trade mark of Eaton Manufacturing Company

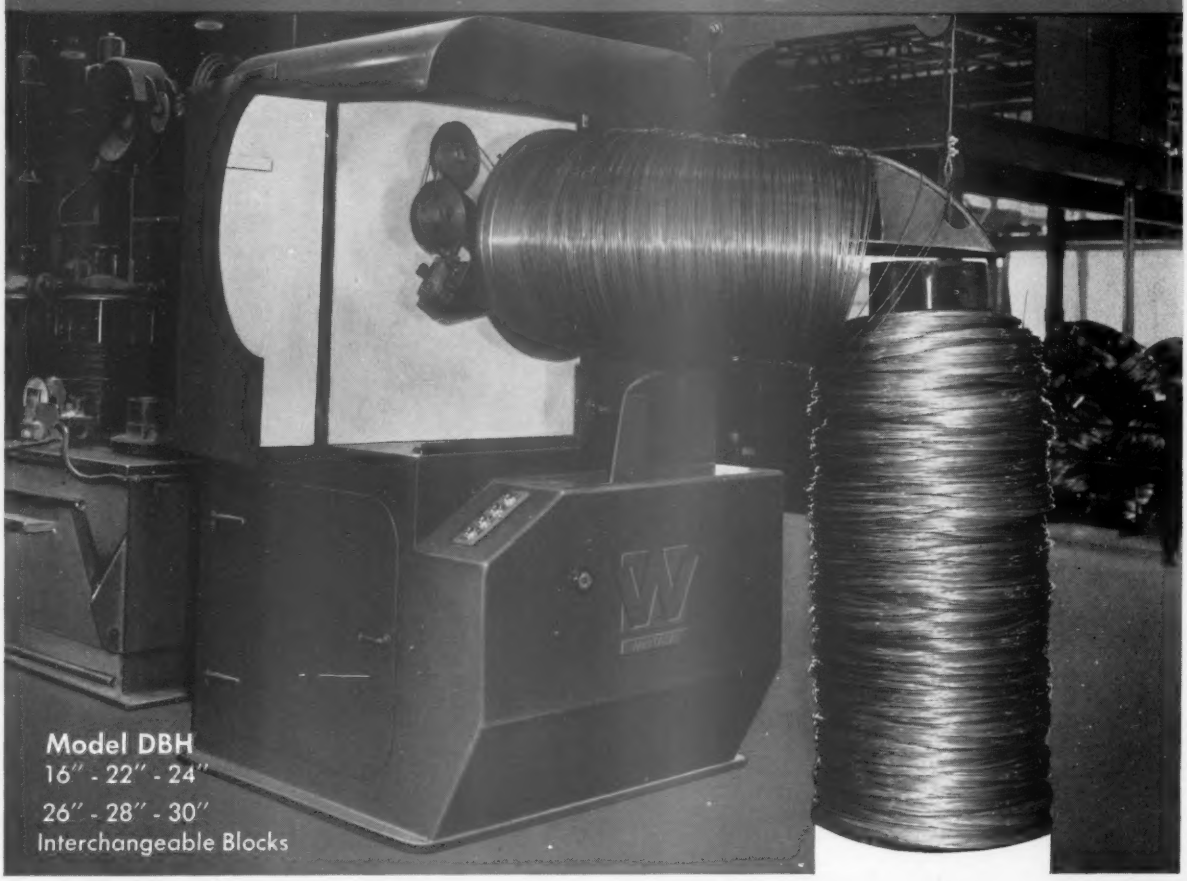
LOUIS ALLIS

AS-214

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

WHITACRE WIRE DRAWING DEAD BLOCK

Water Cooled Die and Block Available



Save with these advantages:

You get continuous increased production because no down time is necessary for stripping...changing dies in a supplying drawing machine..."run down" of accumulation type machines... packaging into stationery container or uninterrupted palletizing on stems... inspection or sampling. There is no tangling nor snarling from handling • Breaks welded in production • No back gearing nor similar mechanism • You save by greatly reduced floor space requirements • Dead block can be located anywhere with wire literally piped from wire drawing machine • Low scrap loss • Increased production through lessened operator fatigue • Design simplicity • Maintenance eliminated except for occasional lubrication of main bearings and motor bearings • Extra large packages for in-process wire • Greatly reduced handling and in-plant transportation costs • Low capital investment.

MODELS AVAILABLE

16" Wire Drawing Dead Block, Model DBM • Model DBH 16" to 30". Model DBXH 30" Wire Drawing Dead Block for heavy gauges and rods including ⅜" • Combination Galvanizing or Tinning Dead Block Take-ups, 16" to 30", Model GF • 26" Heavy Wire Galvanizing or Tinning Dead Block Take-up, Model GFH. Write today for specifications.

APPROACHES

100%

CONTINUOUS

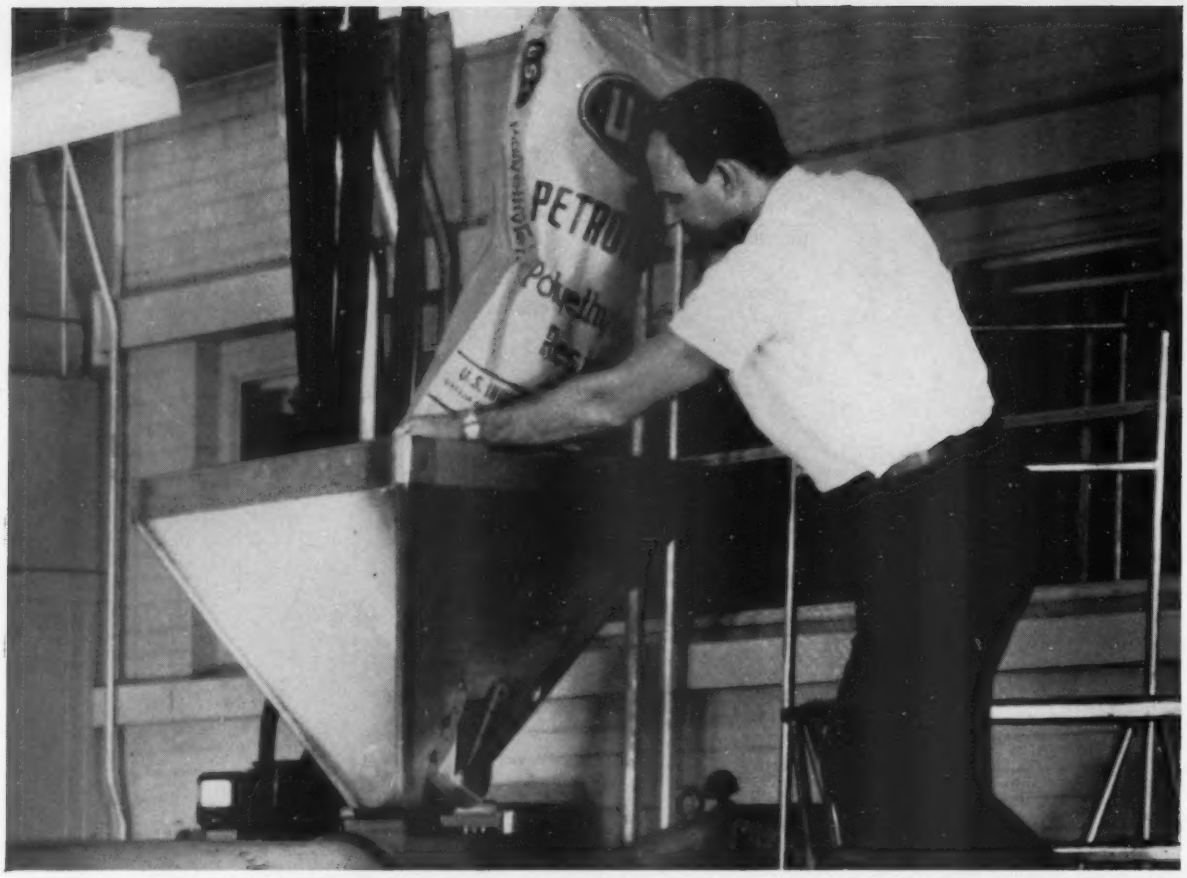
PRODUCTION

EFFICIENCY

WHITACRE

WHITACRE CORPORATION

5649 Alhambra Ave. • Los Angeles 32, California • CApitol 5-2476



You charge the resin as received when you produce polyethylene-covered wire

because polyethylene needs no blending

Manufacturing polyethylene-covered line wire is simple. You feed the resin, as you receive it, to the extruder. There are no plasticizers, softeners, antioxidants to add. There's no prebatching, blending, milling; no vulcanizing after extrusion. Carbon black and antioxidants are already in the resin.

A complete polyethylene production program simplifies operations in other ways too. One production line can take the place of several, providing savings in equipment, floor space, maintenance and labor. Stocking only one material reduces purchasing and inventory problems.

With polyethylene, you base production on a material that has trended downward in price as capacity increased. And ample capacity for PETROTHENE® polyethylene insures continuous supplies of uniformly high-quality resin.

Look To Tomorrow's Sales

See how polyethylene can improve the profitability of your operations tomorrow, if not today. With other insulating costs trending upward, polyethylene can be expected to be your most profitable line wire coating in the years to come. You can prepare for those profits *by promoting polyethylene-covered line wire now,* just as U.S.I. is doing in a series of advertisements in utility magazines.

For your customers, polyethylene means a product that is easy to handle . . . has exceptional weather and stress-crack resistance . . . is long-lasting in service. This tough plastic covering is registering outstanding service records for power cable, communications cable, WD-1 infantry field wire, TV lead wire and many other applications.

U.S.I. PETROTHENE polyethylene resins are tailored to provide the proper balance of properties needed in different end uses. To help you choose the most suitable resin for each use, we've compiled a chart of the properties, applications and applicable specifications of PETROTHENE polyethylene compounds. This information is in a new four-page data sheet, "PETROTHENE Resins for the Wire and Cable Industry." Also available is U.S.I.'s comprehensive 100-page "PETROTHENE Polyethylene . . . A Processing Guide." Write for your copies.

U. S. Industrial Chemicals Co.
Division of National Distillers and Chemical Corp.
99 Park Ave., New York 16, N. Y.

Please send me:

☐ "PETROTHENE Resins for the Wire and Cable Industry"
☐ "PETROTHENE Polyethylene . . . a Processing Guide"

Name_____

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Company_____

Address_____

City & State_____

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corp.
99 Park Ave., New York 16, N. Y.
Branches in principal cities

Another good customer is assured

PREDICTABLE PERFORMANCE

with a SECO **60" SLITTING LINE**

This "custom-built" SECO 60" Slitting Line, recently installed in a midwestern steel company's plant, was designed and built to their exact specifications to provide maximum performance.

Features of this custom-built SECO Slitting Line are:

- Coil weight capacity—40,000 lbs
- 225 fpm line speed with build-up to 735 fpm
- .1875 max. material thickness—5 cuts
- .020 min. material thickness—20 to 30 cuts
- Line arranged to handle sheets or coils
- Power driven hold-down rolls for uncoiling heavy gauge material
- Peeler and Straightener at uncoiler minimizes manual handling
- Variable speed D.C. drive
- Control equipment at operator's desk
- Over-arm separator at recoiler
- Removable housing assembly for quick knife changeover away from slitter

Whatever your requirements, SECO can provide a complete range of Slitting Lines—from 12" to maximum strip widths—as well as other Steel Mill equipment. SECO's staff of trained sales engineers are at your service to assist you with any production problem you may have. Call or write today.

SECO

SECO STEEL MILL EQUIPMENT

- Leveling and Shearing Lines
- Combination Edging and Flattening Lines
- Tension Reels for Strip-Polishers
- Narrow Strip Grinding Machines
- Slitting Lines
- Multiple Strand Pull-out Rolls and Take-up Frames
- Strip Coilers (Up and Down Type)
- Traverse Reels for Narrow Strip
- Steel Coil Up-enders
- Scrap Ballers

Affiliated with Lee Wilson Engineering Co., Inc.

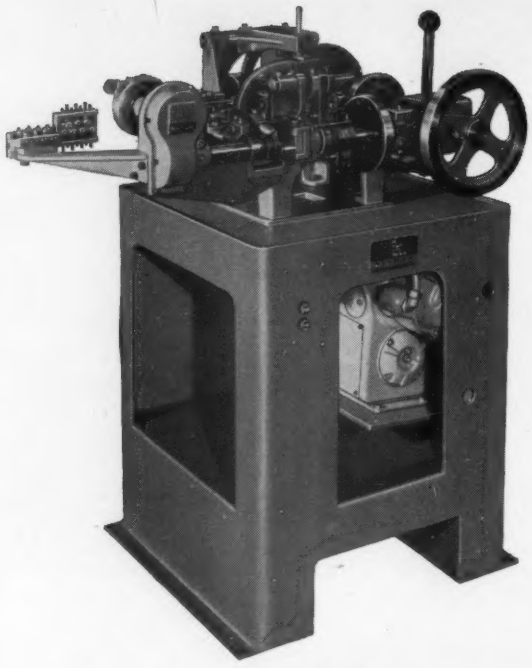
STEEL EQUIPMENT COMPANY

P. O. BOX 737, WARRENSVILLE STATION

CLEVELAND 22, OHIO

PRECISION MINIATURE PARTS PRODUCED WITH SPEED & ECONOMY on a NILSON #00 FOURSLIDE MACHINE

Up to 10,000 parts/hour—miniature electrical, electronic or mechanical components made of ferrous, non-ferrous, alloys, Kovar, Rodar and precious metals.



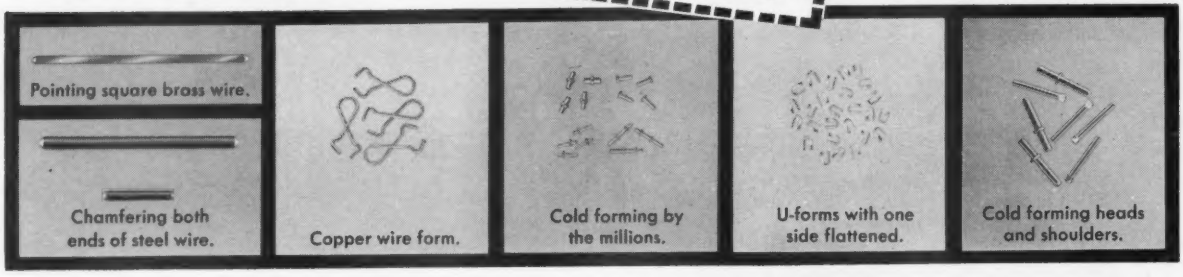
NILSON #00 machine.

WIRE FORMING

from 0.010"-0.040" diameters on NILSON #00 Fourslides.

ALL PARTS SHOWN ACTUAL SIZE

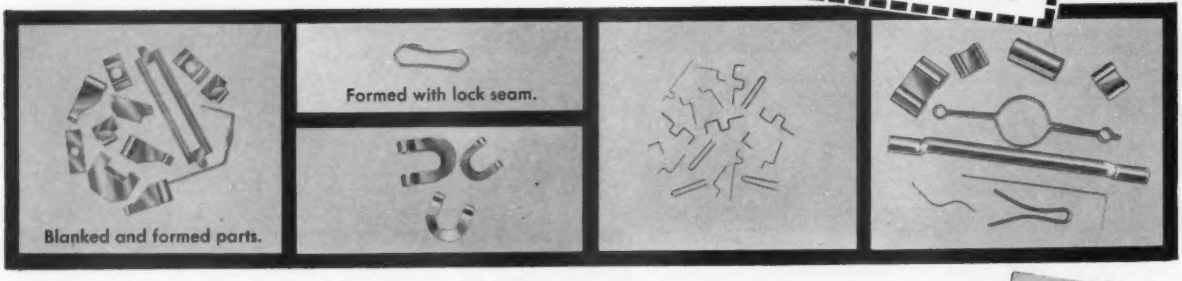
Parts are shown through courtesy of Art Wire & Stamping Company Newark 2, New Jersey


Pointing square brass wire.
Chamfering both ends of steel wire.
Copper wire form.
Cold forming by the millions.
U-forms with one side flattened.
Cold forming heads and shoulders.

RIBBON METAL FORMING

Tolerances held ±0.0005" when required.

ALL PARTS SHOWN ACTUAL SIZE



NILSON

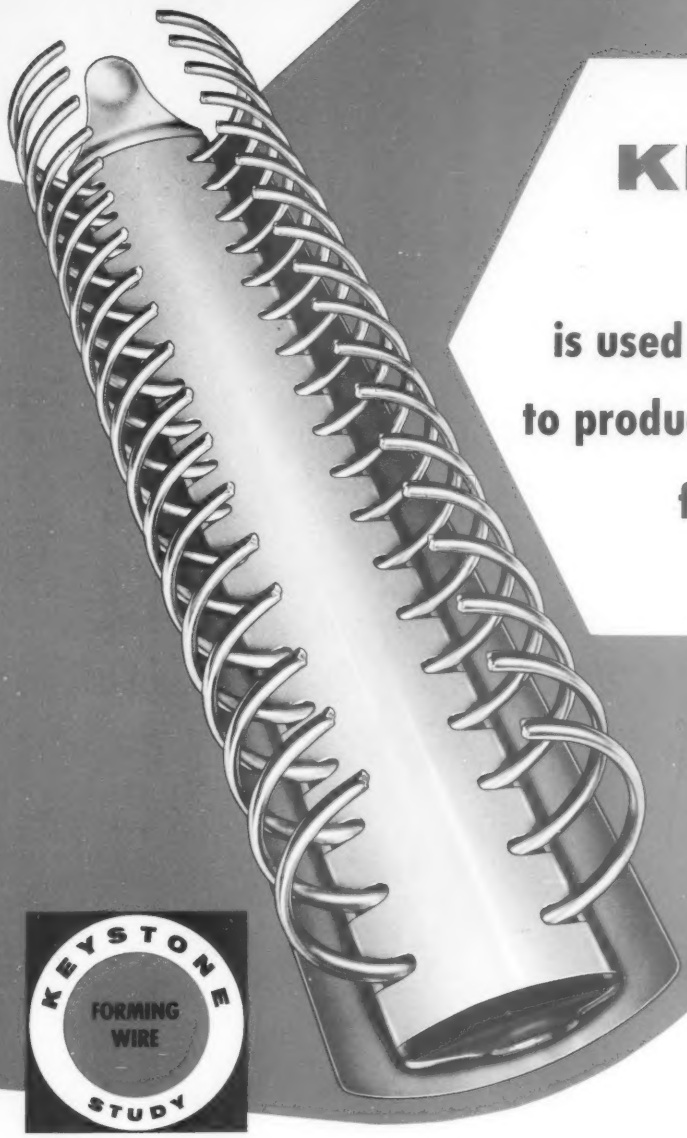
A. H. NILSON MACHINE COMPANY

Write today for FREE CATALOG #62 on the 17 Models of NILSON FOURSLIDES.

625 Bridgeport Avenue • Shelton, Conn. Telephone: WAverly 9-1433

KEYSTONE WIRE

is used by Loose Leaf Metals Co. to produce high quality hardware for loose leaf books



Loose Leaf Metals Co. produces a wide range of quality products, including the rings shown here.

KEYSTONE FORMING WIRE STUDY

Manufacturers of loose leaf binders look to Loose Leaf Metals Co. for their hardware needs. And, in turn, Loose Leaf Metals looks to Keystone for forming wire that has all the necessary properties for quality manufacture of their rings.

To manufacture quality, precision-made rings at low cost on a mass-production basis, Keystone specially-developed copper coated annealed-in-process Forming Wire is used. Its superior quality and constant uniformity result in a perfectly aligned and nickel-plated ring.

Keystone wire for Loose Leaf Metals Co.'s "Perfection" binder rings must have the correct temper so the wire can be rolled into oval shape prior to being formed into rings, then cut, swedged and deburred. In addition, the clean brite finish of Keystone Forming Wire provides a base for successful nickel plating.

The combination of Keystone experienced wire engineering, plus constantly improved marketing techniques of Loose Leaf Metals have resulted in greatly increased production of binder hardware at lower costs.

Perhaps Keystone Wire Specialists can solve your wire problems, too. Call your nearest Keystone representative, or write us for details.
Keystone Steel & Wire Company, Peoria, Illinois

KEYSTONE
WIRE FOR INDUSTRY

For Your Prosperity !
MIYAZAKI'S
TUBULAR TYPE HIGH SPEED STRANDING MACHINE
530 m/m ø × 24 Bobbins
for 61 ply wires
bobbin capacity
260kg (copper wire)
90kg (aluminium wire)
maximum Speed
600 r. p. m.
MACHINERY
FOR
WIRE ROPE & CABLE
Miyazaki Iron Works, Ltd.
Kaizuka, Osaka, Japan.

EVERY FEATURE

for the volume processing and uniform cutting of

STRAIGHT WIRE

up to 300 feet per minute!

The Vaughn® MOTOMATIC

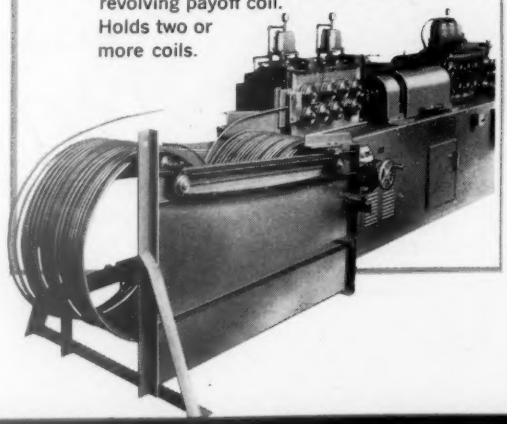
- Delivers uniform diameter bars and precision-cut lengths
- Designed for wide range of wire sizes
- Electric variable speed drive provides stepless range from 100 to 300 fpm
- Eliminates twist through use of caterpillar chain feed

This efficient Vaughn machine affords automatic production of straight, cut lengths direct from the coil, processing the entire coil from end-to-end, and reducing scrap to an absolute minimum. Built to high Vaughn standards of smooth operation, low maintenance and long service life, the Motomatic increases production while reducing labor time and fatigue—a dividend-paying investment year after year. • Send for Motomatic Bulletin No. 751.

The VAUGHN MACHINERY COMPANY
CUYAHOGA FALLS, OHIO, U.S.A.

COMPLETE COLD DRAWING EQUIPMENT . . .
Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

- Quick loading safety reel
  –facilitates starting wire coils into machine and protects operator from revolving payoff coil. Holds two or more coils.



ENTWISTLE BUILT

TO DO TOUGH JOBS . . .

BETTER!

MODEL "THE-24/36"
DUAL REEL

A shaft-type dual continuous take-up for 24" O.D. through 36" O.D. reels weighing up to 1400 Lbs. and for speeds up to 2000 F.P.M.

Modernize for profit by installing an Entwistle Take-up. Handle a wider range of reels and materials on fully automatic equipment.

YOU get these built-in features:

Eddy-current drive and controls
Adjustable, maintained speeds and tensions.
Electric brakes and clutches.
Pneumatic lift and cut-off.
Infinitely adjustable traverse, pneumatically reversed.
Predetermined, Motorized traverse crossover.
Effortless, trouble free, silent service.
Includes wire reservoir tower and measuring.

ASK FOR SPECIFICATION 3C WITH QUOTATIONS

ENTWISTLE
Manufacturing Corporation
1475 ELMWOOD AVE., PROVIDENCE 7, RHODE ISLAND
Over 40 years of dependable service
Formerly James L. Entwistle Co.

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FOREL EQUIPMENT CORPORATION
165 Broadway, New York 6, N. Y.

British Associates
THE KEMSON ENGINEERING CO., LTD.
Wellington Mill, Bolton Road
Blackburn, Lancs., England

BUILD A BETTER, MORE PROFITABLE MESH BUSINESS with . . .

TYPE VEF/10
SINGLE
SPIRAL
AUTOMATIC

Wafios

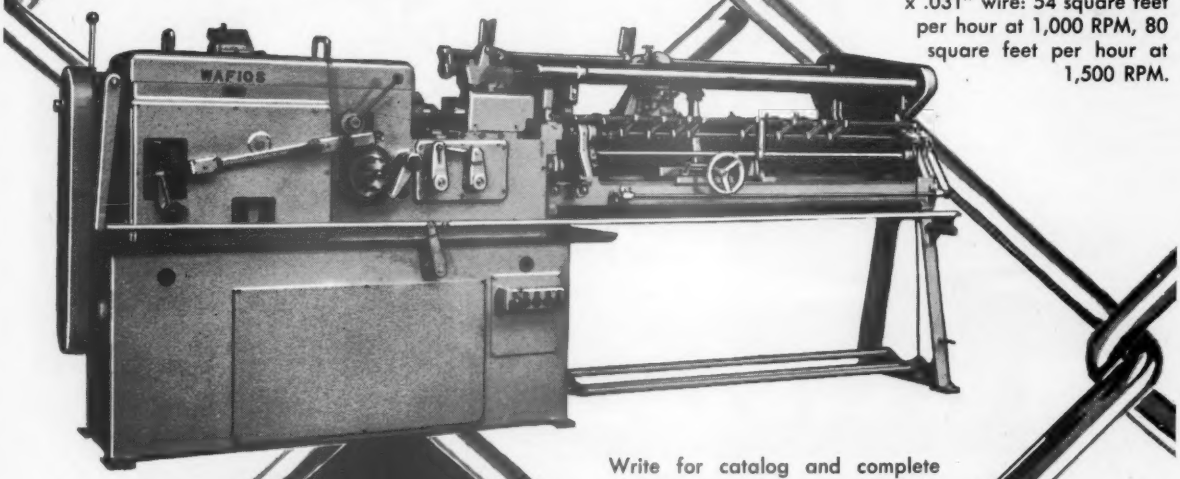
WIRE MESH MACHINES

SUITABLE FOR FIRE SCREENS, CONVEYOR BELTING, NETTING AND CONTAINERS FOR THE FISHING INDUSTRY.

The single spiral chain link automatic VEF/10 as illustrated, is designed for the manufacturer of small mesh, square or diamond shape netting, knuckled on both sides. All operations such as weaving, cut-off, knuckling, counting and winding-up are completely automatic.

SPECIFICATIONS:
Mesh width from 3/16" to 3/4" in wire sizes from .025" to .047" maximum, with weaving width up to 60" maximum.

OUTPUT:
Diamond 3/8" mesh x 4' wide x .031" wire: 54 square feet per hour at 1,000 RPM, 80 square feet per hour at 1,500 RPM.



Write for catalog and complete information about the VEF/10 and our complete line of single and double spiral chain link automatic wire mesh and fence machines.

Wafios supplies weaving machines for crimped mesh; straightening and cut-off machines; highspeed nail presses; spring coilers and automatic coiling and looping machines, etc.

MACHINERY CORP.
61 HUDSON STREET, HACKENSACK, N. J.
WAFIOS-MASCHINENFABRIK, WAGNER FICKER & SCHMID, REUTLINGEN/GERMANY

MODEL NO. 26
WIRE CARRIER MOUNTED ON PAY-OFF REEL

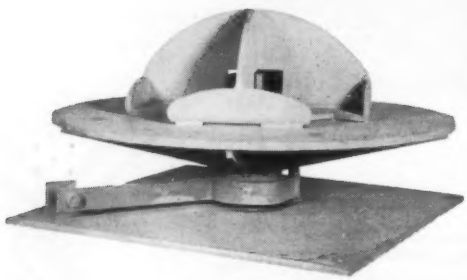
WORKING WONDERS WITH WIRE:

How to reduce changeovers, handling, down-time, scrap-ends 4 to 10 times!

Leading wire producers and fabricators across the country use (and recommend)

NORTHERN INDIANA STEEL'S HIGH CAPACITY, HEAVY DUTY

WIRE CARRIERS and PAY-OFF REELS



MODEL NO. 26
PAY-OFF REEL

Let us know exactly what your operating needs are. If we don't already have the wire carriers and pay-off reels in stock, we're ready to make up your order as per your exact specification. In any case, we'll be pleased to quote you promptly in the quantities you specify.

They feed more smoothly

Handle 2000# to 4000# coils

Stack and store easily

And—They're Designed and Produced To *Your* Specifications

Northern Indiana Steel Supply Co., Inc.

Fabricating Division, Michigan City, Indiana
TELEPHONE TRiangle 4-3241

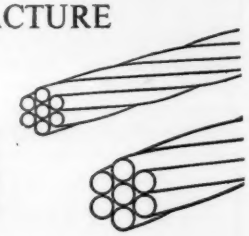
LARGE STRANDS

for prestressed concrete

❀ ❀ ❀

WE ALSO MANUFACTURE

SMALL STRANDS



and plain, indented or crimped wires

RYLANDS

Brothers Limited

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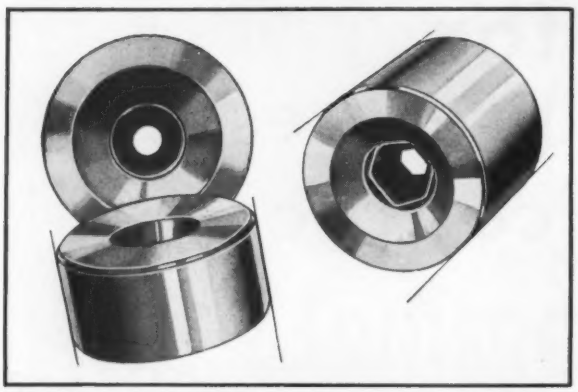
ENGLAND

Metallurgical Memo from General Electric

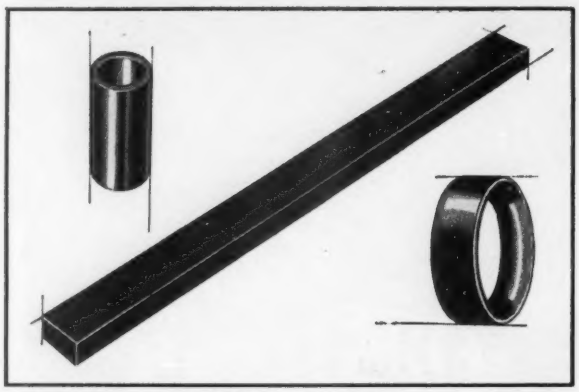
"MOVING METAL" WITH G-E CARBOLOY® CARBIDES

maintains uniformity in size... better finish... less cost per ton with more durable grain structure in the part

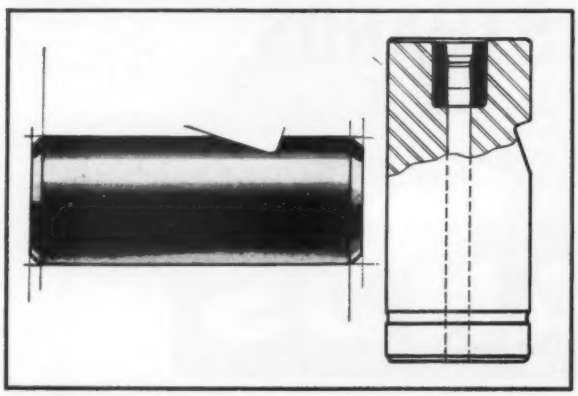
Continuing research by General Electric's experienced metallurgists and technicians gives you Carboloy cemented carbides of highest quality and uniformity—carbides designed to "move metal" at lower cost and with less metal waste. *Metallurgical Products Department of General Electric Company, 11171 E. 8 Mile Street, Detroit 32, Michigan.*



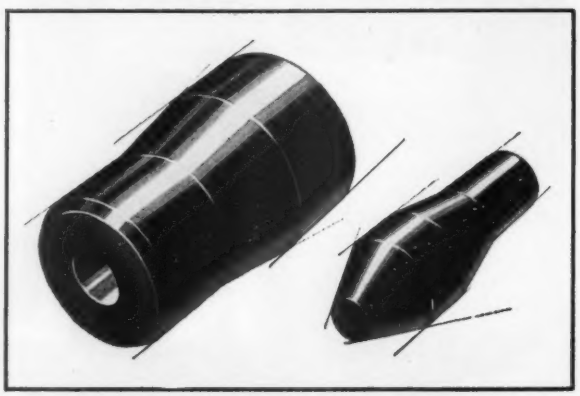
GET MORE WIRE TONNAGE with uniform size and finish. Carboloy carbide wire, bar and tube dies boost product output, permit longer runs with less die wear, minimize downtime. Available in round, square, hexagon shapes.



BOOST WIRE PRODUCTION SCHEDULES by wear-proofing critical parts with G-E carbide wire guide bushings, strips, and guide rings on wire stranding and processing machinery. Last up to 100 times longer in some cases than those made of other materials!



TOP QUALITY AND PERFORMANCE in boltmaking machinery depends on header extrusion dies equipped with Carboloy cemented carbides—which help to produce more uniform parts to closer tolerances; resist stress and strain of the heading and extruding operation.

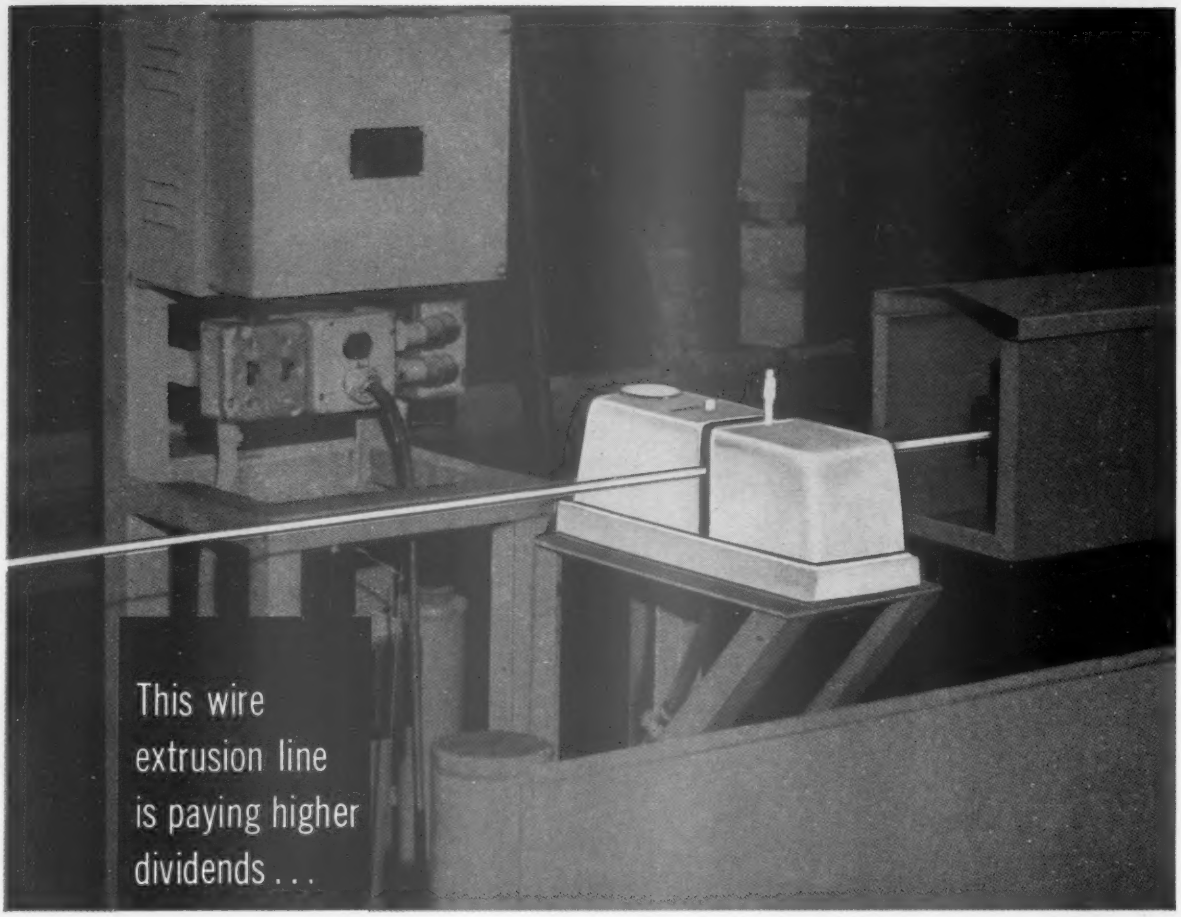


TUBE DRAWING WITH CARBOLOY MANDRELS provides uniform wall thickness. Tailored to your order, G-E mandrels come in brazed and solid carbide styles. Brazed-type custom-made from standard and special Carboloy nibs. Available from your Authorized Die Distributor or Diemaker.

CARBOLOY®
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT
GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS • MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS



Read how you can cut production costs, boost output with **WESTON MICROLIMIT CONTROL**

You can easily provide continuous, noncontact gauging and automatic regulation of wire production with the Weston Microlimit Gauge. The instrument offers continuous quality control by measuring wire diameter with sensitive photoelectric cells. Almost instantaneous adjustment of production variables is made through the control console.

You can save 2% or more on material costs alone, because expense of overcoating is reduced through closer tolerance control, and start-up waste is cut by 50%. At the same time, you can maintain higher wire production speeds.

Weston Model 5110 Microlimit Gauges are used for a host of applications, including thermoplastic and rubber insulated wire, extruded tubing, rods, shapes, and filaments, in sizes ranging from .001" to .750".

Sensitivity of ±0.1-mil is possible with Model 5110. Direct gauge setting may be made with a calibrated spindle. For extreme accuracy, the unit's deviation indicator is adjusted using a standard reference rod. Standard ranges are: .001/.025"; .025/.5" and .025/.75".

Best results are obtained when the unit is used between extruder and talc box for pan-cure rubber; on either side of capstan for PVC and PE extruders; and between extruder and oven for Teflon and Silicon.

Call your Weston Representative for full details on the Model 5110 Microlimit Gauge, or write: Daystrom, Incorporated, Weston Instruments Division, Newark 12, New Jersey. *International Sales Division: 100 Empire St., Newark 12, New Jersey. In Canada: 840 Caledonia Rd., Toronto 19, Ontario.*

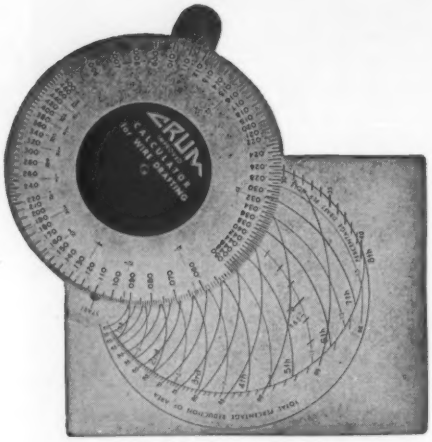
DAYSTROM, INCORPORATED
WESTON INSTRUMENTS DIVISION

SAVE SET-UP TIME WITH THE...

CRUM CALCULATOR

FOR WIRE DRAFTING

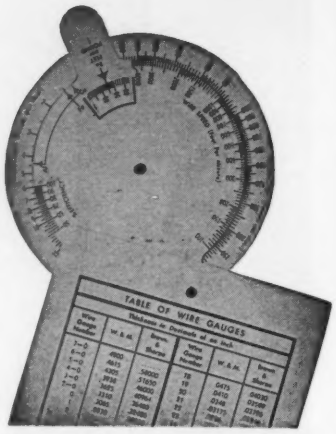
Useful and Accurate!



Front view of Crum Calculator

THIS NEW DOUBLE-PURPOSE CALCULATOR WILL:

1. **Provide quicker and more accurate information on die sizes and reduction areas;**
2. **Calculate wire production rates for various speeds and efficiencies.**



Reverse view of Crum Calculator

SOME OTHER FEATURES OF THE CALCULATOR

- Has new scale for more accurate determination of small percentages.
- Gives readings in B & S gauges.
- Intermediate lines provide reductions for 16 holes in one setting.
- New rectangular shaped back for better protection of calculator.
- More legible % draft-per-hole scale.
- Vinyl plastic construction, resistant to wear, warping, dirt, perspiration, wire drawing soaps—can be cleaned.
- Still fits your vest pocket.
- Handy tables of W & M and B & S gauges.
- Feet per pound calculating scale for steel, copper and aluminum wires.
- Durable, accurate, easy to use.

The improved Crum Calculator is worth its weight in gold in time saving—no laborious mathematical calculations necessary when you use it. Instruction sheet with examples accompany each Calculator. You should have one or more in your wire drawing department.

THE PRICE: $5.00 EACH

Send your orders to:

WIRE AND WIRE PRODUCTS

453 MAIN STREET **STAMFORD, CONN.**

(Exclusive distributors)

You'll Find
Yawata's
Steel Wire Rods
Everywhere

YAWATA IRON & STEEL CO., LTD.

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YAWATAISCO NEWYORK

Why utility engineers now specify

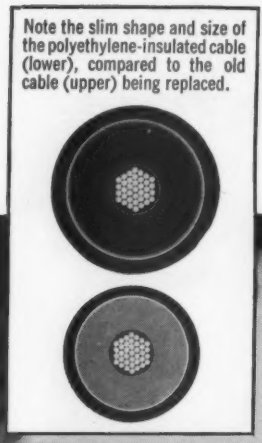
POWER CABLE INSULATED WITH MONSANTO POLYETHYLENE

• better abrasion resistance • lower power factor; less power loss in transmission • low surface tracking • excellent moisture resistance • less bulk, less weight

Leading manufacturers now produce power cable insulated with polyethylene based on Monsanto Polyethylene resins, specially developed and perfected by Monsanto. For complete technical data including applicator's information, write to Monsanto Chemical Company, Plastics Division, Room 730, Springfield 2, Massachusetts.

Monsanto®

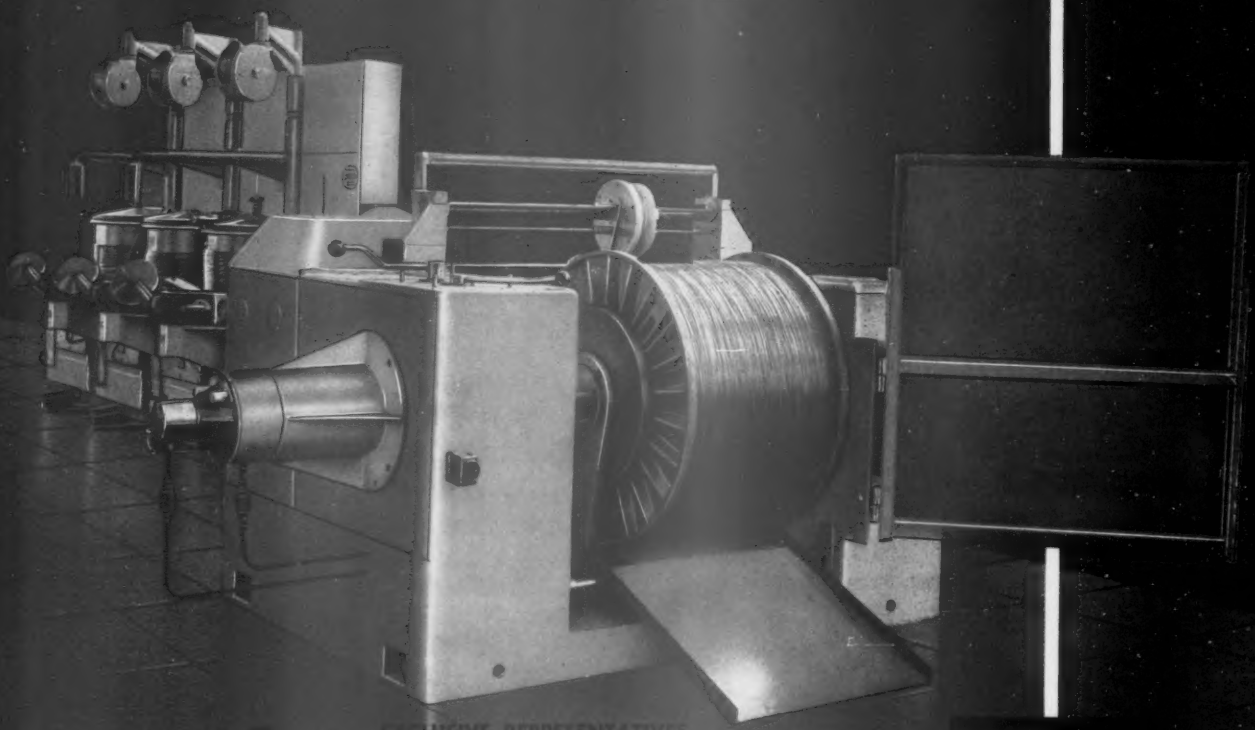
MONSANTO ACTIVATOR IN **PLASTICS**



Note the slim shape and size of the polyethylene-insulated cable (lower), compared to the old cable (upper) being replaced.

New 15,000 volt polyethylene-insulated power cable installation at main sub-station, Monsanto Chemical Company, Plastics Division plant, Springfield, Massachusetts. Installation-rated at 175 amps, 15,000 volts. 3-phase system, 1 conductor per phase. Conductors are 133,100 circular mil copper, with 37 strands. Insulation consists of: 1 layer black fiberglass tape, 297 mil polyethylene insulation, metal shielding, 6/64" vinyl jacketing.

NEW DEVELOPMENTS CONTINUE!

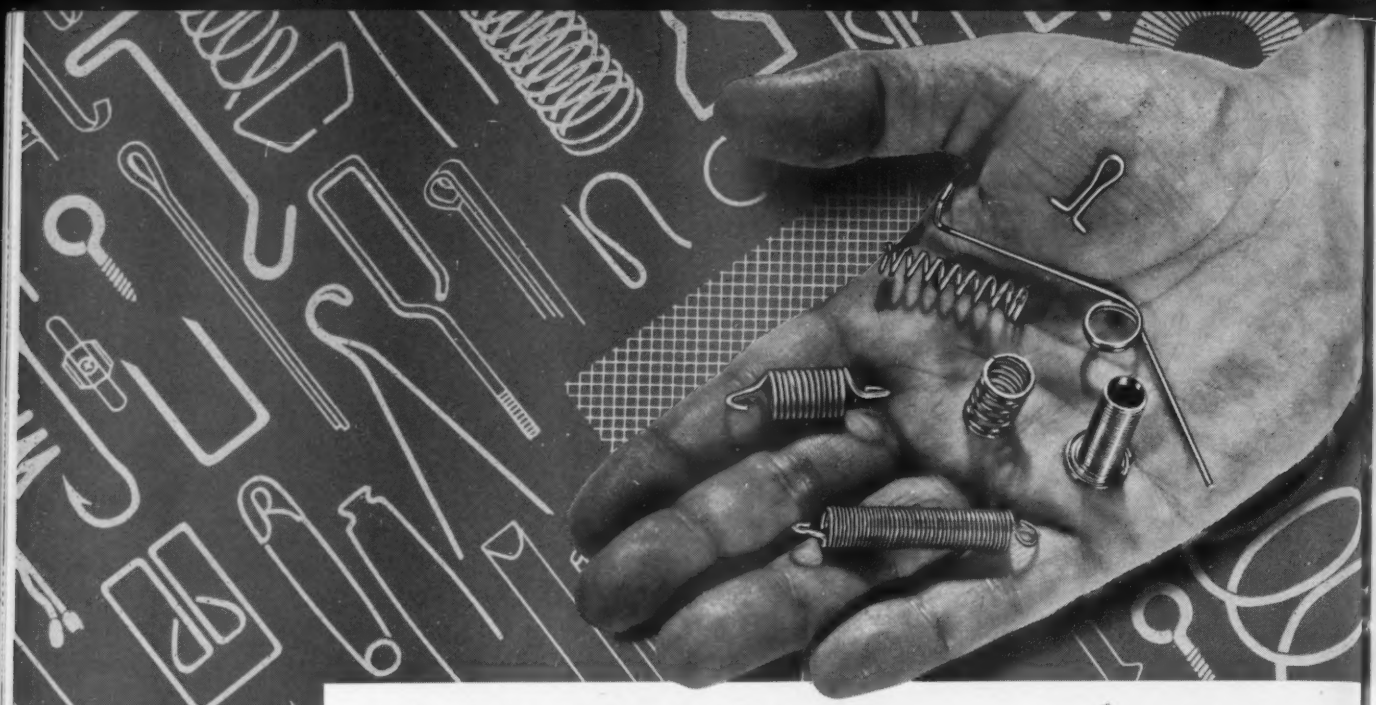


EXCLUSIVE REPRESENTATIVES
FOR U.S.A. AND CANADA

AMERICAN LAUBSCHER
Corporation

NIEHOFF MACHINE WORKS

SCHWABACH NEAR NURNBERG WESTERN GERMANY



PAGE SPECIAL HB
Can Cut Wire Costs Up to 60%

You can use PAGE *Special* HB for many jobs where music wire has always been specified—and save up to 60% on your wire costs! Tensile strengths of *Special* HB, which is available in the size range .020″ diameter to .162″ diameter (bright finish and galvanized), approach those of music wire in all sizes—and in sizes .090″ diameter and coarser equals them! Here are some typical examples:

SIZE	STANDARD HB	SPECIAL HB	MUSIC WIRE
.1620	219,000 min.	**249,000 min.**	249,000 min.
.1350	227,000 "	**258,000 "**	258,000 "
.0800	244,000 "	**276,000 "**	282,000 "
.0200	310,000 "	**320,000 "**	350,000 "

If you now use music wire, or have been prevented from using it because of its high cost, it makes sense to investigate PAGE *Special* HB.

WHATEVER your wire requirements, you can count on PAGE quality from America's leading special-purpose wire mill. PAGE will give you the tensile strength, ductility, finish, tolerance and other properties you require in a wide range of manufacturers wire items — including corrosion-resistant ACCO *Aluminized* Wire and wires of special shapes.

Write for details. Write us at Monessen, Pa., for Booklet **DH-107a** for the story on PAGE *Special* HB—or for information on other wires.

ACCO

PAGE MANUFACTURERS WIRE

Page Steel and Wire Division • American Chain & Cable Company, Inc.

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

PAGE — *the source for answers to wire problems*

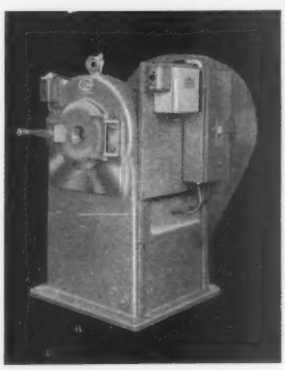
Left — Fenn Model 7F Swager. *Right* — A Model 6F points end of wire coil prior to drawing.

Wire Pointing with FENN Swaging Machines

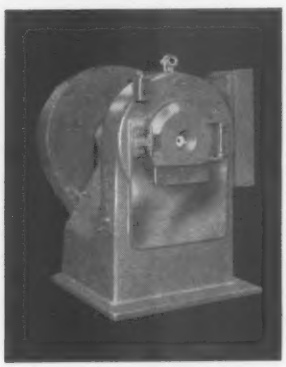
The wide preference in the wire industry for Fenn Swaging Machines for primary pointing prior to drawing can be attributed to their ability to produce heavy reductions with dependability and with minimum maintenance. From the rugged one piece solid meehanite frames to the precision machined roll cage assemblies, Fenn Swagers are engineered and built to deliver under heavy production schedules. Only Fenn makes all types of swaging machines . . . in a complete range of sizes that will swage solids from 5/32" to 3-3/8" . . . and in 2-Die or 4-Die models. A complete line of manual and hydraulic feeds greatly increase the Swager's productivity and accuracy . . . with far less operator fatique. We invite you to consult with our swaging engineers.

The Fenn Manufacturing Company, Newington, Conn.

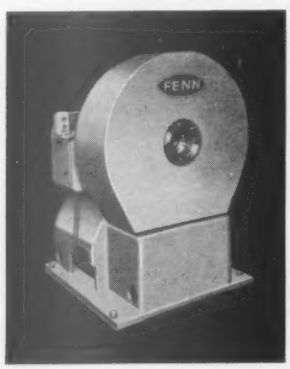
Rotary 2-Die



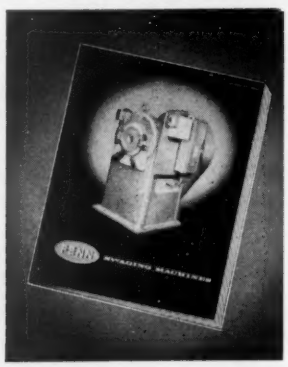
Rotary 4-Die



Stationary Die

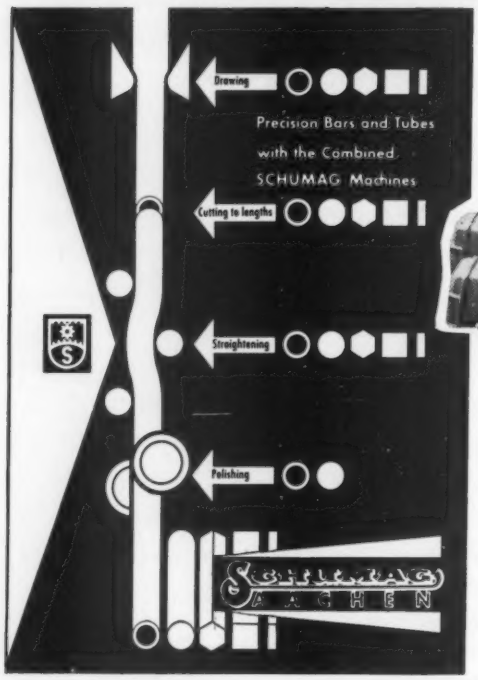


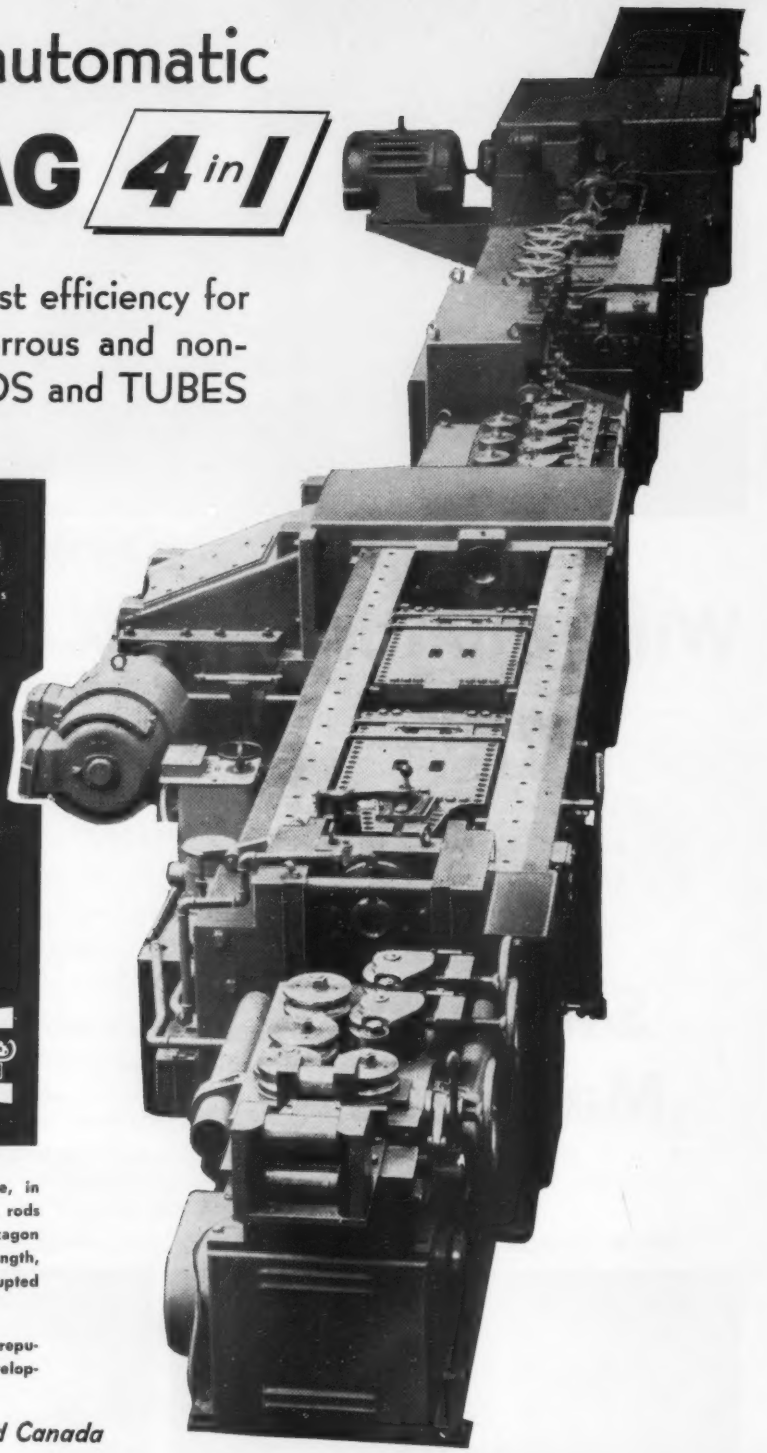
Write for Catalog!



The fully automatic
SCHUMAG 4 in 1

ASSURES... greatest efficiency for manufacturers of Ferrous and non-Ferrous BARS, RODS and TUBES





- SCHUMAG "4 in 1" machines produce, in one continuous operation, finished bars, rods and tubes from round, square or hexagon material. They will finish draw, cut-to length, straighten and polish in one uninterrupted sequence.
- SCHUMAG "4 in 1" enjoys world-wide reputation as the ultimate in technical development.

Exclusive Representatives for U.S.A. and Canada

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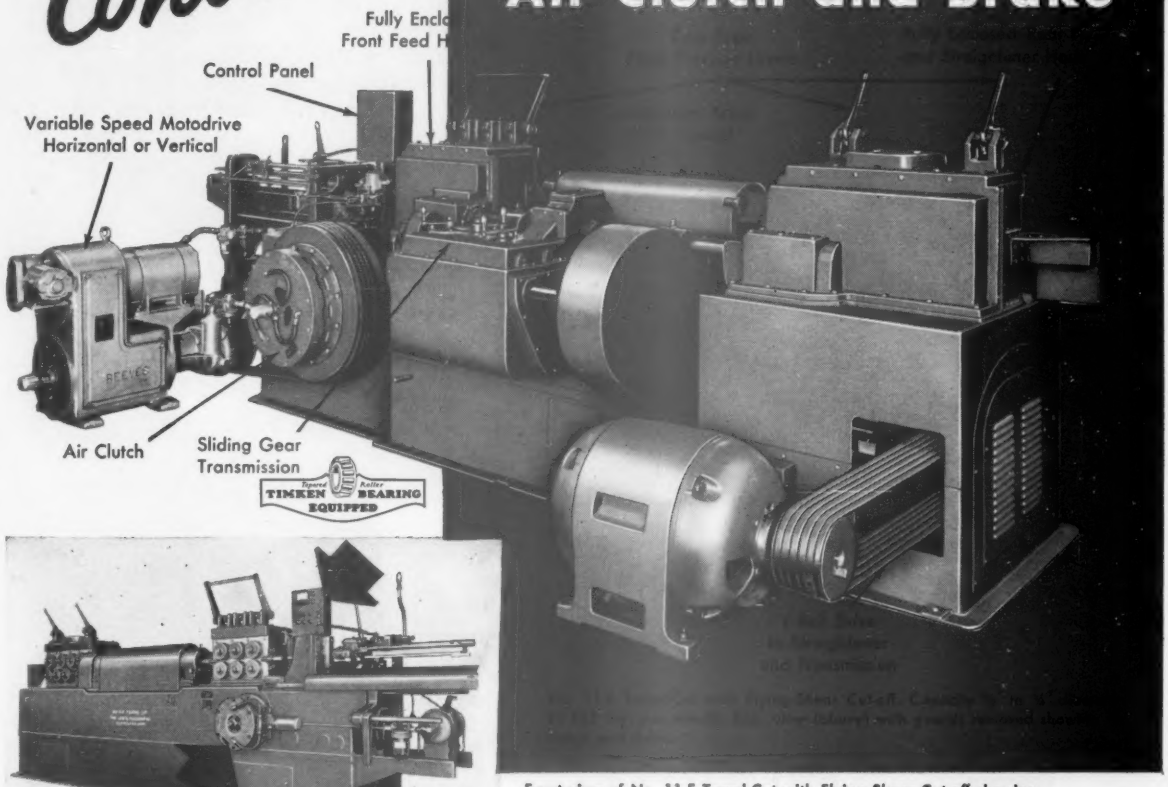
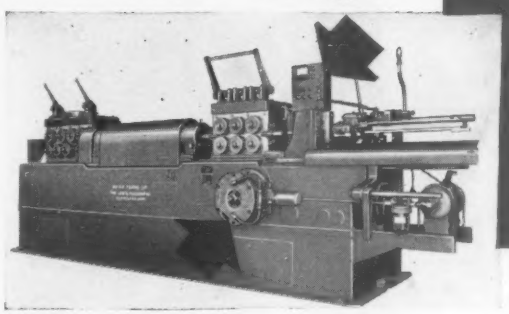
SCHUMAG AACHEN

Better Quality Control *

LEWIS

Wire Straightening and Cutting Machines with Air Clutch and Brake





Front view of No. 11-F Travel-Cut with Flying Shear Cut-off showing Air Brake "A" (with guard removed) and operating panel "B" with push-button controls for Air Clutch, Reeves Motodrive and flywheel speed Indicator Tachometer.

● Lewis engineers have added three important improvements to their famous Travel-Cut Machines for BETTER QUALITY CONTROL . . . These machines are already in service in America's leading steel and wire mills.

✳Wichita Air Clutch permits higher cut-off speeds, eliminates shock of conventional clutch. No adjustment necessary . . . automatically compensates for wear.

✳Wichita Air Brake eliminates conventional mechanical drag brake and is only engaged for a short portion of the cut-off cycle.

✳Reeves Variable Speed Motodrive permits infinite adjustment of flywheel speed for perfect synchronization of the cut-off and wire feed speeds. This unique arrangement makes possible the cutting of rod WITHOUT SPOT SWELL . . . allows finer adjustment for cutting short lengths. Dial tachometer registers flywheel speed.

There are Standard Lewis Travel-Cut or Stationary-Cut Machines designed to straighten and cut all materials and shapes in wire or rod from .012" to 1" at a wide range of feed speeds.

Air Clutch available on all Travel-Cut Models. Send for new brochure showing complete line of Lewis Wire Straightening and Cutting Machines.

LEWIS MACHINE COMPANY

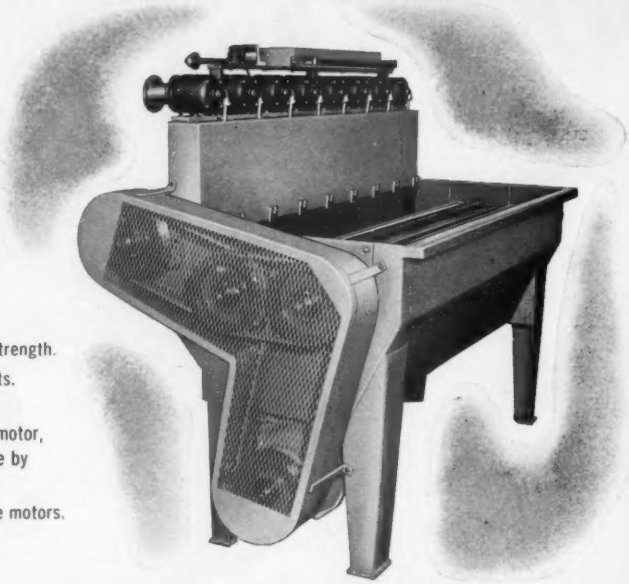
3440 East 76th Street
Cleveland 27, Ohio

STRAIGHT-ROLL WIRE DRAWING MACHINE

8 HEADER • 14 PASS • 1250 FPM • RUGGED • COMPACT • NO VIBRATION

The Watkins STRAIGHT-ROLL WIRE DRAWING MACHINE

Compact basic design, rugged construction and design detail for maximum rigidity give this machine the ability to handle 8 heads, each having 14 passes and a finishing die, at a wire speed of 1250 FPM and higher within a floor space of 40" x 77" without vibration.



ROLLS Two drive rolls, one capstan roll in close-coupled arrangement. 5" diameter. Easy removal.

TUB All-welded construction. Heavy plate.

SHAFTS 2" diameter. Journaled in heavy duty flange-type ball bearings. Shaft seals in tub walls.

DIE HOLDER Extra-heavy construction for maximum rigidity and strength.

MAIN DRIVE 7.5 HP 220/440 Volt electric motor. Double vee belts. Removable guard.

TRAVERSE Travel is adjustable from 3" to 6". Gearhead servo motor, controlled by limit switches, actuates traverse frame by rack and pinion drive. Mechanism enclosed.

SPOOLING Finished wire led to spools on shafts of eight torque motors. Individual ON-OFF and speed controls.

R S WIRE MACHINES

R. S. WATKINS & SONS, INC. Glen Road, Sandy Hook, Conn.

VIBRATING WIRE CUTTER

REMOVES WIRE FROM SPOOLS IN SECONDS

R S WIRE MACHINES

The Watkins Vibrating Wire Cutter is a unique machine that permits removal of fine wire from full or partially filled spools in seconds. Rapid removal allows spools to be reclaimed and wire to be salvaged without recourse to costly hand methods.

Revolutionary in design, the unique operating principle of the machine allows simple, straightforward construction with design features that contribute to ease of operation and long service life. Tests conducted under actual production operating conditions have proved unit capability. The simple operating procedure can be learned in a very short time. All mechanism is totally enclosed and operates in oil. The cutting member does not harm the spool, yet slices easily through any number of turns of wire without effort by the operator.

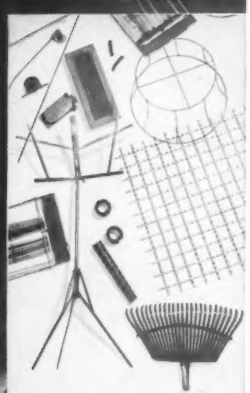
A guide table provides quick reference of spool position for optimum cutting action. Table position is adjustable to accommodate spools from 2" to 6" in diameter. Descriptive literature is available. Inquiries are invited.

R. S. WATKINS & SONS, INC. Glen Road, Sandy Hook, Conn.

Advantages for You

IT ALL COMES DOWN to one fact...that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered, scaleless tempered, tempered and polished, blued or strawed.

You pay for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. For details, write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.



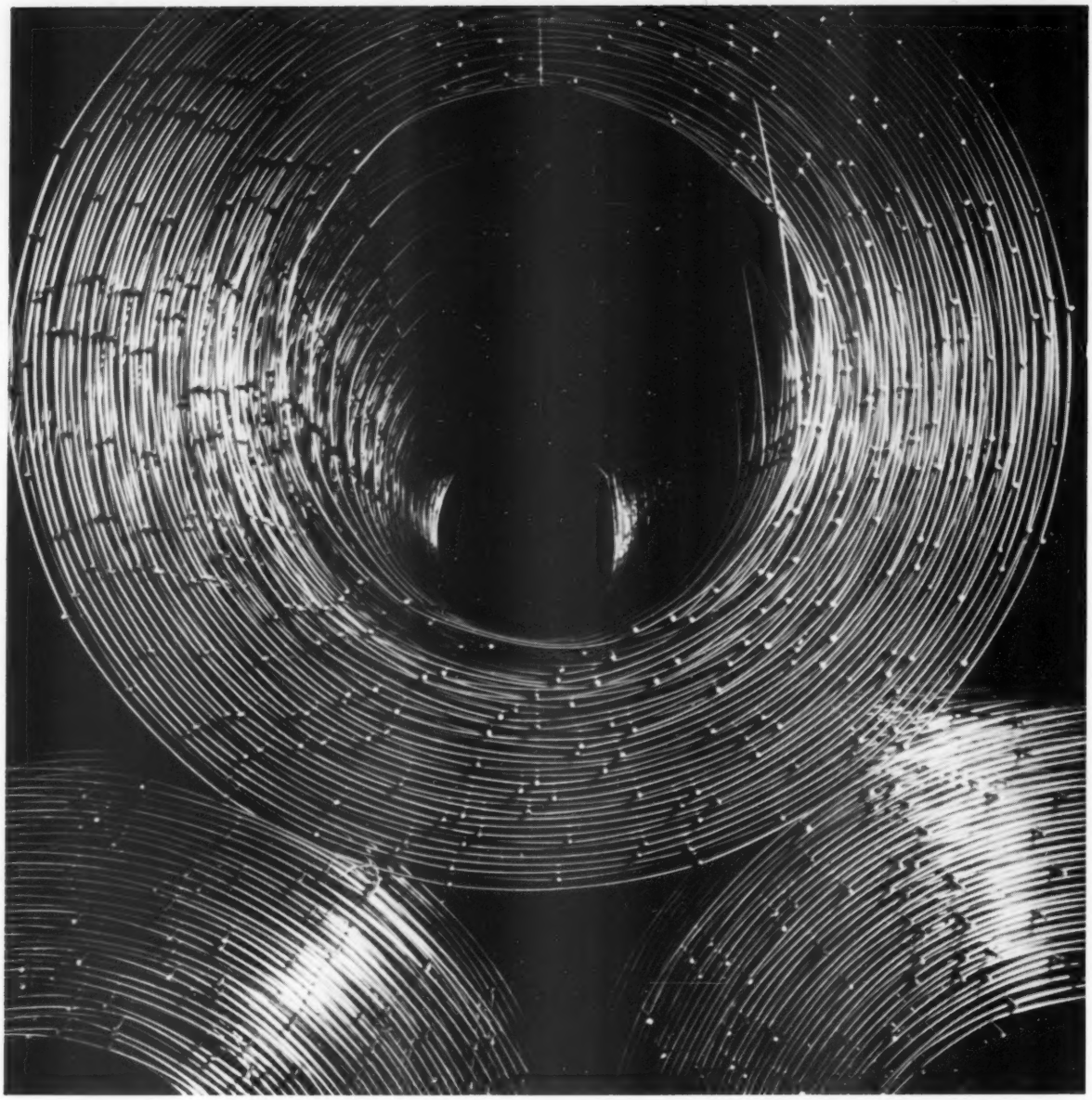
A few of the thousands of high-quality items made from superior Roebling cold rolled steel.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

PHOTO BY MCMANUS



For nearly half a century we have been engaged in the development and manufacture of resistance welding machines and it will soon be 15 years since we built our first mesh welder. This many years' experience has proved invaluable in the development of modern mesh welding plants. Today we have a complete range of machines available.

SCHLATTER

Size 1 for light mesh in rolls and sheets, wire ϕ 0,05 to 0,16 inch, width 79 inch
Size 2 for concrete reinforcing steel mesh in rolls and sheets, wire ϕ 0,12 to 0,39, width 104 in.
Size 3 for concrete reinforcing steel mesh in rolls and sheets, wire ϕ 0,12 to 0,39, width 147 in.
Size 4 for concrete reinforcing mesh in sheets, wire ϕ 0,16 to 0,47 inch, width 147 inch
Size 5 for heavy concrete reinforcing steel mesh in sheets, wire ϕ 0,16 to 0,47 in., width 104 in.

H. A. SCHLATTER Ltd. ZOLLIKON-ZURICH (Switzerland)
Manufacturers of Electric Welding Machines and Electronic Controls

Representative for Canada and the U.S.A.

PAUL REICHER MACHINERY and EQUIPMENT, LTD.

600 EGLINGTON AVE., EAST **TORONTO 12, ONT., CANADA**

IMPROVED QUALITY PRODUCTION

LOWER PRODUCTION COSTS AT

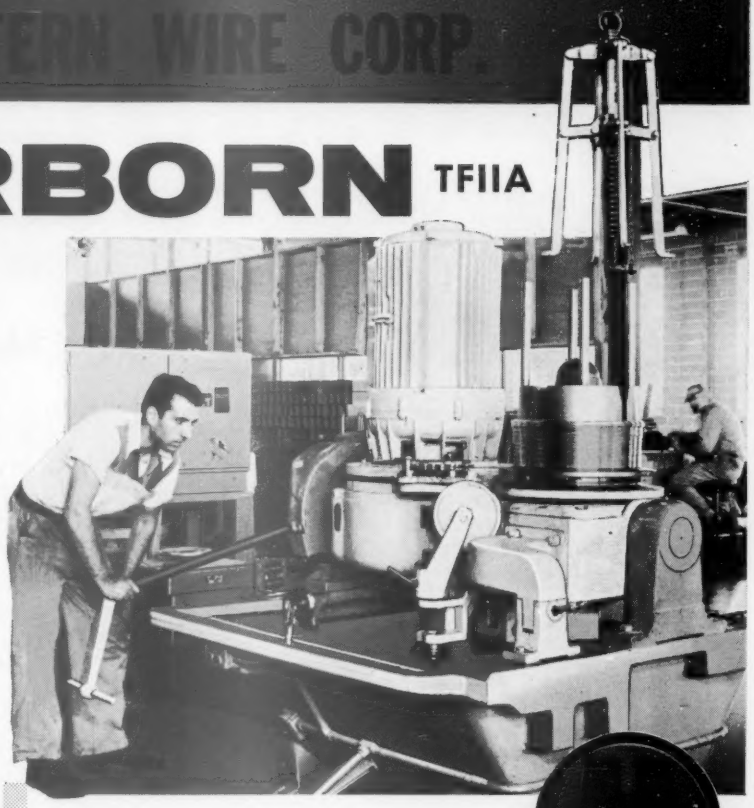
GREAT EASTERN WIRE CORP.

with the **HERBORN** TFIIA

WET DRAWING WIRE MACHINE

with 7 DRAFTS

"We use the Herborn TFIIA for wet drawing of fine wire over the whole range," says Mr. Golembeske, President of Great Eastern Wire Corp. of Elizabeth, N. J. "The finished product exceeds anything we've done before in quality, and the one motor drive for seven drafts means big production savings for us."



DRAWING RANGE TFIIA

- For low and high carbon steel wire from .120" - .104" to .054" - .020"

The **Model TFIIA** is fitted with a vertical, flange-mounted motor. The drive is transmitted through spur gears. This machine is particularly suited for the wet drawing of low and high carbon steel wire and is designed for 5, 7, 9, or 11 drafts. Control by means of a foot operated switch greatly facilitates threading. The Model TFIIA can be equipped with a 2 or 3-speed gear unit, providing up to 6 different drawing speeds, up to approximately 2,000 feet/minute.

Herborn manufactures a complete line of dry and wet wire drawing machines for all types of ferrous and non-ferrous metals; rod and wire pointing machines; mechanical descalers; buttwelders; drawing dies; spoolers, etc.

Write for complete catalog about the Model TFIIA, TFIIC, CUII and others.

HERBORN
MACHINERY CORP.
61 HUDSON STREET • HACKENSACK, NEW JERSEY
MASCHINENFABRIK HERBORN
Berkenhoff & Drebes A.-G.
Herborn/Dillkreis (Germany)

NOW!! EXHIBITS!!

AT THE 1960 WIRE ASSOCIATION CONVENTION

LaSalle Hotel, Chicago, Illinois

Exhibits: November 13-16, 1960

Technical Sessions: Nov. 14-17, 1960

Every year at the Annual Convention of the Wire Association more firms have indicated interest in exhibiting their products and equipment. As exhibit space was not available, firms resorted to improvised room exhibits.

This practice has expanded each year to the extent that the situation has become unwieldy. Because of this the hotel must restrict exhibits to a specific area, thus eliminating all room displays.

For those firms wishing to take advantage of the sales opportunities of the Annual Convention of the Wire Association, the hotel has set aside the Illinois Room for such exhibits.

Booth size is 6′ x 8′, but more than one booth can be secured, if desired. The price for a booth is $96.00, including one sign, chairs and tables.

As operating exhibits are permissible this arrangement should offer a splendid opportunity for firms to demonstrate equipment and products. However, due to the limited amount of space available, the space assignments will be made in the order of their receipt. Firms interested should immediately contact

J. EDWARD DONNELLAN
VICE PRESIDENT

WIRE AND WIRE PRODUCTS

453 Main Street **Telephone DAvis 3-0482** **Stamford, Conn.**

Announcing the NEW HUD-PAK

HIGH SPEED WIRE PAYOFF PACKAGE

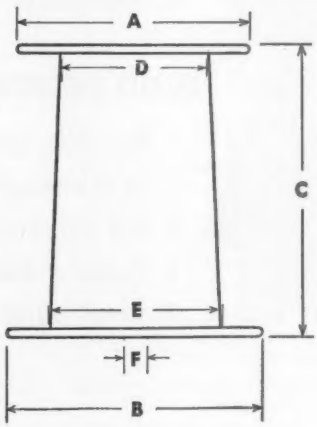
Are You Looking For High Quality Bare Or Coated Wire In The Most Modern Up-To-Date Package?

- High Speed Payoffs.
- Controlled Tensions For Single And Multiple End Winding Operations.
- Large Payoff Packages.
- A Rugged Container To Protect Wire In Use Or Storage.
- Instantaneous Starts And Stops.
- All At Regular Wire Prices.

The exclusive new HUD-PAK is the most important money-saving development in wire packaging in 20 years. With many conductor and AWG sizes, users report record payoff speeds in excess of 5000 feet a minute. HUD-PAK reduces waste from short spools. Its tapered barrel spool—and absence of inertia found with rotating spools—permit instantaneous starts and stops with no danger of wire shakedown and tangle.

We are currently supplying HUD-PAKS containing bare copper wire, tin plated, silver plated, and aluminum wire. Other types are being developed. Optimum results can be obtained within the size range of AWG 38 to AWG 24.

The term "HUD-PAK" is a trade-mark of Hudson Wire Company



	A	B	C	D	E	F
HUD-PAK 120	10"	11"	13½"	6½"	7½"	1¼"
HUD-PAK 50	8½"	9½"	9⅞"	6"	7"	1¼"

CAPACITIES

MATERIAL	Approx. Weight (lbs.)	
	120	50
COPPER	120	50
CADMIUM COPPER	120	50
ALUMINUM	37	16
BRASS 70/30	115	48
PHOSPHOR BRONZE	120	50
NICKEL SILVER	115	50
STEEL	107	44

HUDSON WIRE COMPANY
OSSINING DIVISION, OSSINING, NEW YORK / TELEPHONE: WILSON 1-8500

COULTER & McKENZIE

continuous

WIRE DRAWING & PACKAGING MACHINE

MODEL 116B: PRECISION BUILT
CUSTOM ENGINEERED

SUPER FAST BLOCK CHANGES — Push-button control interchanges 3 standard size draw blocks in seconds with **no gear or belt changes.** (8″, 10″ and 12″ blocks)

EXTRA VERSATILE PACKAGING — Accommodates coils, stems, and Draw-Pak containers. (20″ x 30″ or 23″ x 30″ drum)

IMPROVED DESIGN FEATURES:

1. Positive tangle switch
2. Fully enclosed
3. Liquid cooled
4. All steel welded construction
5. Electric clutch for "Soft Starting"

GREATER PRODUCTION CAPACITY

1. Continuous drawing and packaging of ferrous or non-ferrous wires
2. Wire sizes to .100″
3. Number of reductions — 3 to 12
4. Speeds to 1000 ft./min.

Model 116-B will be custom engineered to your particular job.

For information concerning your application, please write or telephone.

This equipment manufactured under one of the following U. S. Patents 2,732,060; 2,868,474; 2,844,416; 2,868,268 or others pending.

Barron & Crowther Ltd., Eastleigh, Hants, England. European Draw-Pak Licensee. Idos Industries Ltd., Royston, Herts, England, Sales Agents.

35 UNION AVENUE

TELEPHONE EDISON 5-1101
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THE COULTER & McKENZIE MACHINE CO INC

SINCE 1843 BRIDGEPORT 7, CONNECTICUT, U.S.A. INCORPORATED 1881

The Wire Outlook

What about inflation?

Enlightened industrial leaders have been waging a losing battle against inflation for many years. Inflation results, we all know, from those artificial measures of government control, the ratio of the national debt to the GNP, and the pressures by which wages constantly are increased.

The last is by far the easiest one to spot as an immediate cause and to it is attributed most of the blame for the deterioration of the dollar's purchasing power. The other forces are nevertheless as inexorable in their results as the continuing demands of labor unions.

Business can and does adjust itself to the upward spiral, even though it suffers from increasing competition from abroad as the wage disparity between our workers and those of foreign lands widens. The real hardships imposed by inflation fall upon individuals living on fixed incomes and endowed institutions. Prices rise, but income doesn't.

The whole business was started in 1934, when the country went off the gold standard, the price of gold raised to stimulate inflation, and reasonableness in spending was tossed out the windows at Washington. Bad practices, such as price supports, the endowment of bureaus with powers beyond the pale of legal regulation, and the entry of the government into business operations were instituted and still are operative.

While the incumbent Administration has demanded curtailments of spending, a balanced budget and many reforms that would simplify and reduce government operations, the politically minded solons have been unwilling to cooperate, so that from the government's side, no basic anti-inflation measures have been put into effect.

Many economists believe that inflation now is over and that, because of a balanced budget in the coming fiscal year, the economy has been stabilized. This can hardly be true. The answer will lie to a certain extent in what labor will do in the next few years, and further, to a large extent, on what action Washington takes with respect to those policies that have for the last quarter century been a basic or underlying cause of inflation. What labor does in securing new rounds of wage increases merely is to give the inflationary forces a nudge that usually is reflected more or less promptly.

Real stability, however, is never static. Under stable conditions, opportunity is offered for a healthy, normal and steady broadening of markets for products that individuals and businesses can afford to buy. Under conditions of inflation, which never affect all branches of our economy simultaneously and similarly, there is a false sense of prosperity, since markets at home tend to shrink because of lessened buying power and because of the impetus it gives to the sale here of products made outside of the country.

It is essential that the wages of American workers be increased if prices of goods, services, raw materials and production equipment continue to increase, in keeping with the cost of living. American management has recognized this in acceding to many wage demands. The problem has been complicated, however, by demands that outstrip man-hour production and labor-inspired regulations that limit productivity and necessitate the employment of superfluous man-power. This is management's perennial thorn in the flesh.

Most efforts to beat the relentless functioning of economic law through controls produce baneful side effects. Unfortunately, efforts to control conditions are not limited to governments. Industry takes a crack at it when possible and labor unions regularly engage in the practice of trying to control business for their special benefit. Government tampering with economic law, however, should not be confused with its rightful obligation to police business and labor. No government or business is big enough or wise enough to beat the fundamental laws of supply, demand, and conditions. The less tampering we have, the sounder will be the national economy.

The kind of Congress elected next November means much to our economic future and all citizens should examine closely the past records of those seeking election — incumbents or aspirants — and their platforms. Persons wanting to increase government spending, to expand the socialistic trend, or who resist sensible reforms, should be rebuked summarily at the polls. Whom we return to Washington will affect everyone, management, labor or white collar workers.

Edmund D. Sickels

EDITOR

PROGRESS . . .

the right combination of the correct ingredients . . . properly used!

C. F. & I. WICKWIRE recently announced DOUBLE GRAY—X . . . a premium wire rope with extra long life . . . direct result of a new wire drawing process developed by C. F. & I. WICKWIRE which depends on a special "Steelskin" Wire Drawing Compound incorporating *just the right proportion of* ***Molysulfide*** ® dramatic new product of THE CLIMAX MOLYBDENUM CORPORATION.

Use of the new compound puts a "molecular jacket" finish on the wire which helps cushion the individual wires in each strand of DOUBLE GRAY—X against the effects of bending, crushing and abrasion . . . helps eliminate any possible imperfection and friction in the drawing operation . . . helps wire retain the inherent toughness . . . increases the life of the rope! Perhaps we can work with you, as with C. F. & I. WICKWIRE, in developing better wire products through the use of ***Molysulfide*** ® wire drawing lubricants. Just write, or call

Steelskin
REG. U.S. TRADE MARK

R. H. MILLER

COMPANY, INC., Homer, N. Y.

METAL WORKING LUBRICANTS

WIRE
AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 35 AUGUST, 1960 No. 8

How Deadblocks Increase Wire Mill Production

by Ray Hulen
Chief Engineer
Whitacre Engineering & Manufacturing Company
Los Angeles, California

A paper presented at the West Coast Regional Meeting of The Wire Association at Los Angeles, California, on June 9, 1960.

Everyone affiliated with the steel wire industry realizes what foreign imports have done to our domestic market. One wire mill superintendent, having considered the problem, gave us his answer. "I cannot wait for Congress to act," he said, "I must fight imports by improving my production and costs now."

* * *

This man, and others like him, will succeed in the battle. He was taking positive action. He has completely equipped his shop with deadblock drawing equipment. His goal was to improve quality, quantity and efficiency.

* * *

Each individual in the business must take a positive attitude and act accordingly. Problems beyond your control, such as metal costs, are to be conquered by others. Your problems are mainly personnel, equipment and methods. The latter two can be controlled.

* * *

When considering equipment and methods, we must be practical, but we must also be receptive to new concepts that will surely come in the wire industry. Some are with us today. More are to come. Some will be of major scope, some minor. All merit consideration.

* * *

One concept, deadblock drawing, is not new, yet the advantages are not being fully exploited today. Few mills are fully utilizing this method to increase production and efficiency. It is quite possible that deadblocks will better enable you to meet the challenge.

* * *

Your mill cleans, coats and draws rod, which is converted into a number of fiinished products. The cleaning operation is a real problem, but everyone acquainted with it is striving for improvement. No doubt, someday a better way will be found. From the cleaning house the rod enters the drawing department.

* * *

The rods are carried several coils to a package. The coils are butt welded while still on the hooks and we have a continuous flow into the drawers. Most often, here efficiency starts downward in varying degrees. Not too many years ago, the merits of a continuous machine were argued pro and con.

* * *

Today we must become aware of any possible deficiencies that exist in any phase of our operation. We must reexamine in the light of present technology.

When considering drawing machines, we do find a deficiency. Frequent stopping and re-starting. Stopping to strip the finishing block, moving to the stripper frame and tieing off. These nonproductive periods are eliminated by using deadblocks. If the wire must be bundled in small packages, it is more economically done elsewhere.

* * *

A deadblock drawing machine, when combined with any drawing machine, increases production by (1) eliminating the need to stop and strip the finishing block and (2) providing a larger coil package. Output per drawing machine, on the average, is increased twenty-five percent. Some mills have actually retired several drawing frames. Three and four thousand pound coils are produced using deadblocks. This size coil will supply most subsequent operations for approximately one turn.

* * *

Many practices are in use to obtain the most benefit from deadblocks. Some mills merely soften the draft in all holes. Others skip the ripper block. Some use the ripper but skip the last hole or the last two holes. The versatility of the combination is amazing. All methods provide more available horsepower in the supplying machine. All provide more pounds of

drawn wire per man per turn. There is a deadblock solution to your particular problem regardless of the size of your shop, the type of equipment you now have, or the nature of your product.

* * *

It is true that capital expenditure is necessary. But the investment required for greater and more economical production for total units produced is quickly amortized. Compare costs of deadblock additions to your existing machines with the cost of the latest model continuous machines. You will find the deadblock addition well worth the investment.

* * *

Those of you planning to attend the tours tomorrow, will have the pleasure of inspecting one of the countries finest and most modern wire mills. You will find deadblock machines in operation on the drawing line. Some of these machines have been producing since 1956. You may form your own opinion regarding the value of deadblock operation. I think you will agree, this is progress.

* * *

For those of you unable to make the tour, and for you who are making the tour, but are not familiar with the machine, so that you may better appreciate what you will see, I offer a brief description.

* * *

The principle may be likened to that used in the fishing spinning reel. The spool does not rotate. The line is laid on the spool by an arm, which rotates about the spool. The deadblock drawing machine operates the same way. The spool or block is stationary. An arm rotates about the block and lays the wire upon it. The arm also carries the drawing die. The problem is how to hold the block stationary and allow the wire to change from a horizontal plane to a vertical plane and accumulate on a stationary stem.

* * *

Several methods have been used to hold the block. Some have been discontinued. One in use today on some machines is the epicyclic gear train. This method involves attaching a gear to the machine frame and a similar gear to the back of the block. Two like pinions on a common shaft are rotated about these gears. The carrier for the pinions is also part of the arm that lays the wire on the block. Because the gear mounted to the machine frame can not rotate, the gear fixed to the block must keep the same relative position; thus the block remains stationary. Sound complicated? It is! Additional power is required to hold the block over and above the power required to draw and coil the wire.

* * *

The simplest method is to lay the coiling block's curved extension, the storage arm, upon the stem which collects the drawn wire. Thus a part that ordinarily performs a minor function is doing part of the work. When the stem is full, a hook and crane arrangement raises the storage arm, allowing the full stem to be replaced with an empty. Meanwhile, the wire has collected on the storage arm. When the hook is removed, the accumulation is loaded onto the new stem. The operator is now free until the stem is full again.

* * *

All deadblocks pull the wire into the machine through a horizontal hollow shaft. The wire automatically passes out of the shaft, ahead of the block and is threaded around a series of pulleys. The drawing die is aligned with the wire pass line between the last pulley and the coiling block. The pointed wire is run through the die and is gripped by commonly used "wire pullers." All deadblocks have storage arms which store the wire and change its direction to collect onto a vertical stem. The design of the storage arm varies according to the manufacturer. Some are curved, some are straight. Various types of arresting devices are employed to discharge the wire off the storage arm in a regular and uniform manner.

* * *

This briefly describes a drawing operation with a deadblock attachment. In addition to the advantages described above, there are also other benefits. Many users are assigning four drawing/deadblock machines to one operator. Wire needing annealing or spheridizing can be coiled directly on the stems used in the pot annealing furnaces. The time cycle required for this operation can be reduced providing the wire is properly stacked. These are important savings in direct labor. Another benefit is lessened operator fatigue and no exposed hazards while the deadblock is operating. The operator or inspector can sample or inspect stationary wire. Here you have a safety dividend at no extra cost.

* * *

Summing up, installing deadblock wire drawing machines can increase your production, increase your efficiencies and decrease your costs. This is exactly what you are striving for!

* * *

Because of the differences in your products, in your present equipment and the various techniques existing in your shop, I have been speaking in generalities. I have attempted to portray the basic advantages of deadblock operation.

* * *

Certainly, progress in the wire industry is sorely needed today. The years immediately ahead will yield major advances. Those who father them, whether from equipment development or operating technique, will enable the industry to resume at full operation and to produce at a profit. All members of the firm that I represent are proud to play a small part in that program.

THE WIRE ASSOCIATION OFFERS YOU . . .

Many advantages as a member. These are described in a booklet: "The Wire Association — What It Is and How It Functions." It will be mailed to you upon request.

All men concerned with production problems are invited to join.

THE WIRE ASSOCIATION

453 Main Street Stamford, Conn.

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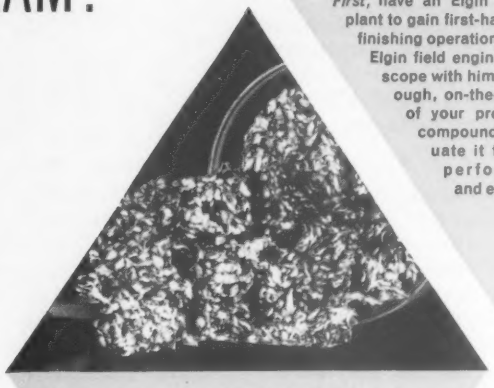

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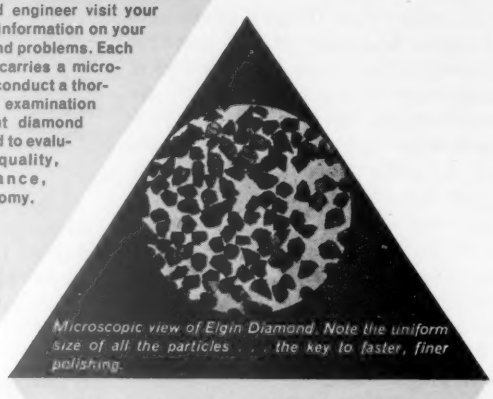

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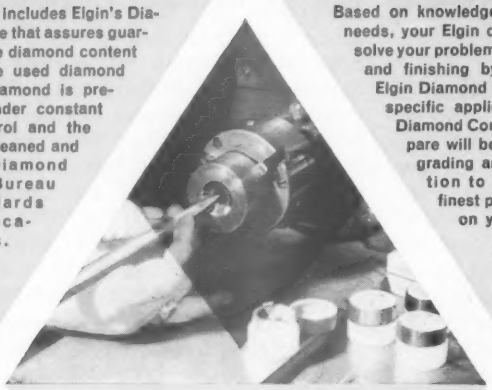

A typical application of Elgin Diamond is its use by a Midwestern alloy manufacturer who draws wire from some of the toughest alloys made. The firm's engineers determined that efficient, economical production depends on "a mirror finish free from all scratches on the carbide drawing dies." To obtain such a finish, they specified Elgin Diamond.

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The New Nickel Alloys in Wire For Special Applications

by Kenneth Paul Brown
Pacific Metals Company, Ltd.
Los Angeles, California

A paper presented at the West Coast Regional Meeting of The Wire Association on June 9, 1960, at Los Angeles, California.

Forty years ago when a company purchased wire it merely called for "wire," which naturally meant steel wire. Thirty years ago it became necessary to call out the grade of steel wire needed for a specific job. Twenty years ago you had to specify the particular alloy you wished to purchase. Ten years ago, in 1950, when ordering wire it was not enough to spell out the alloy, but suppliers had to know the end use in order to supply the proper alloy, temper, and grade. Today, the customer states his application and the supplier tries to fit an existing alloy to the requirements, or it may even be necessary to develop a special wire to solve his problem.

* * *

As a result of these demands placed upon raw material producers for more specialized alloys to meet more specialized applications, the mills work continuously to develop new alloys, new methods of improving existing alloys, and new production methods to cut costs. One of the largest and most rapidly expanding fields of special alloys is that of the high nickel alloys. Several of the major metal producers have been working with nickel based materials to meet industrial problems. The International Nickel Company has produced alloys to meet all types of situations from corrosion to those requiring high strength at high temperatures and numerous other properties.

* * *

Nickel adds a very interesting variety of properties to materials when they are alloyed with this element. It adds toughness, corrosion resistance, oxidation resistance at elevated temperatures, ductility, etc. Almost everyone has had some contact with such nickel alloys as Monel, Inconel, and their families.

I would now like to touch on a less familiar and more recent group of high nickel alloys, Inconel "X," Inconel "700," Inconel "702," Inconel "718," and Ni-O-Nel.

* * *

A few years ago General Electric Company called our office and explained that they had a problem where they needed material to withstand a temperature of 2500 degrees Fahrenheit. They were developing a periscope which would be placed at the aft section of a jet engine. The idea of this periscope was to be able to watch the ignition system in jet engines in an attempt to discover what was causing flame-out and engine failure. We advised that there was a new alloy called Inconel "702" which was basically an Inconel composition (15% Cr, 70% Ni, with .75% Ti and 3% Al added) which was supposed to have exceptional resistance to oxidation. However we had no idea what would happen to the alloy under their described service conditions as the alloy was comparatively new and little data had been collected. They indicated the important property they needed was oxidation resistance and that strength was secondary, as the only strength required at this temperature was the ability to support its own weight. G. E. subsequently reported to us that the alloy did possess the oxidation resistance they required and the experiment had been successful.

* * *

International Nickel Company states that this alloy, Inconel "702," after having been exposed in air at 2400° F. for 100 hours, showed no more than .001 inches of oxide penetration. The oxidation resistance of this alloy at this temperature is more than twice that of Inconel, the more familiar high temperature alloy.

* * *

The tensile strength of Inconel "702" (see Table II) at room temperature is approximately 142,000 PSI and at 1800°F. it is about 19,000 PSI. These are considered maximum properties developed by age hardening at 1400°F. for five hours. Little use has been made of the mechanical properties at temperatures under 2000°F. as there are other alloys which possess higher strengths. It should also be noted that there is little point in aging this material when it will be used at 1800°F. or higher.

* * *

Inconel "X," Inconel "700," and Inconel "718" are all age hardenable alloys which have high strength and low creep up to 1500° F., as well as high strength and ductility at sub zero temperatures in the range of liquid oxygen. The typical compositions of these alloys are noted in Table I and it can readily be seen that they are basically Nickel-Chrome alloys with additions of Ti, Al, Co, and Mo.

* * *

Inconel "X" has been in existence for a little over ten years and has become established as a standard alloy for many applications in the aircraft and related fields. There are different treatments for it, depending on the temperature range in which the alloy will be used. Some of the typical properties are noted in Table II. The tensile strength of the alloy after aging is 162,000 PSI at room temperature and 140,000 PSI at 1000°F. It then falls to 55,000 PSI at 1500°F. It should be noted that excellent high temperature creep properties can be developed through proper aging.

TABLE I
TYPICAL COMPOSITIONS

	Ni	Cr	Fe	Ti	Al	Mo	Co	C	Mn	Si	S	Cu	Cb & Ta
Inconel "X"	70.	15.	7.	2.2	.65			.08	1.	.5	.01	.5	1.
Inconel "700"	45.	15.	7.	2.2	3.	3.	28.	.16	.1	.25	.008		
Inconel "702"	Bal.	15.	2.	.75	3.			.1	1.	.7	.01	.5	
Inconel "718"	53.	18.	Bal.	.8	.4	3.							5.
Ni-O-Nel	42.	22.	Bal.	.1		3.		.05	1.	.5		2.2	

TABLE II
ULTIMATE TENSILE PROPERTIES IN STRESS PER 1,000 PSI
Temp. in Fahrenheit

	78°	200°	400°	600°	800°	1000°	1200°	1400°	1500°
Inconel "X" **	162	160	158	155	150	140	120	81	55
Inconel "700" ***	171	169	165	160	152	148	145	130	106
Inconel "702" *	142	139	135	130	125	120	90	79	65
Inconel "718" *	190	180	175	170	165	158	160	120	80
Ni-O-Nel (Annealed)	102	93	93	93	91	87			

* Sheet material in the aged condition.
** Bar stock, aged in accordance with AMS 5668. (Note: 5667 has slightly higher properties.)
*** Bar stock, age hardened, solution treated 2160°F. for 2 hours, air cooled, and aged 1600°F. for 4 hours.

Inconel "700" differs from Inconel "X" in many respects, the most significant being the addition of 28% Co and 3% Mo to develop high mechanical properties. Inconel "700" can be age hardened to develop tensile strength, as noted in Table II, and will still have approximately 60,000 PSI tensile strength at 1700°F. This alloy is produced only in rod and bar, and has not begun to realize its full potential.

* * *

Inconel "718," the newest of the high temperature alloys, has 3% Mo and 5% Cb plus Ta added, with Nickel being decreased to approximately 53% and Fe being increased. The most significant mechanical property is the high yield strength developed through aging and cold working. Inconel "718" has a yield strength of 130,000 PSI at .2% offset at 1200°F., and 108,000 PSI at 1400°F. These yield properties are considerably higher than those of either Inconel "X" or Inconel "700."

* * *

The corrosion of sulfuric acid, sulfurous acid, phosphoric acid, nitric acid, nitrates, cupric, ferric, and mercuric salts have long presented a problem to the users and processors of these chemicals, due to the expense of handling and outright corrosion problems. Ni-O-Nel, Ni-Fe-Cr alloy plus Mo and Cu, is quite resistant to reducing acid solutions due to the added Cu. Not only is it resistant to these reducing acids, but it is also resistant to a variety of oxidizing chemicals due to its high Cr content (see Table I).

* * *

This alloy has useful mechanical properties as well as corrosion resistance. Ni-O-Nel has a tensile strength at room temperature of 102,000 PSI in the annealed condition, and can be cold worked by drawing to produce 158,000 PSI tensile strength (see Table II).

* * *

The coming of the rocket engine, jet engine, and atomic reactor have brought with them many different fabrication and operational problems, from chemical corrosion to high temperature metal problems. One of the most prevalent requirements is for an alloy that will not oxidize or spall at temperatures above 2000°F.

* * *

One such problem concerned a small metallic part used by a local rocket engine manufacturer. It was necessary for the part to be ceramic coated and baked at a temperature of 2350°F. for a prescribed period of time. This part traveled in the furnace on a standard heat resisting alloy hook which supported the part while being baked. The enameler, however, was having problems with his enameling hooks and they were oxidizing after only a few cycles. We asked him to try Inconel "702" wire, which he did and subsequently reported that the hooks which were formed from the wire showed no signs of relaxing or spalling.

* * *

Another application for Inconel "702" wire and one which will probably have more use in the future is for flame diffusers. The wire is woven into wire cloth and then formed into a funnel-shaped contraption which fits over the end of the aft section of the burner. This prevents the flame from going unchecked. With regard to this application it is felt that Inconel "702," in the form of wire cloth, will find many uses from filters to heat-treat baskets. This latter application is one that has immediate possibilities.

* * *

Another application for Inconel "702" wire, and no doubt the area that will have the largest tonnage, is that of fasteners to be made by cold or hot-heading wire. Already we are supplying wire in small coils to various manufacturers of rivets and bolts for such applications. These applications are all experimental, but are quite indicative of what is to come.

* * *

Inconel "X" has developed hundreds of different uses since it was developed in the late forties. One such use is in atomic reactors as "hold down springs" in core components. This spring is not only subjected to high temperatures, but to "hungry water" (that is, high purity water) corrosion and possibly to radiation. Inconel "X" will handle this service. In valve springs for jet and rocket engines it has found many outstanding applications because it retains spring properties up to 1300°F. Another very interesting Inconel "X" spring application is one in which the spring is required to sit idle at 1200°F. for one year, at the end of which time there must be sufficient spring properties to trigger a mechanism that will shut down the reactor.

* * *

The largest tonnage of Inconel "X" wire, however, finds more use as a bolting material. These bolts for the most part are cold-headed, but hot-heading is also used, particularly on the larger diameter bolts. These Inconel "X" bolts will be used primarily around the hot spots of the jet and rocket engines. Apparently this is a rapidly expanding field for this alloy as is noted by the sales of heading wires. Inconel "X" wire for weav-

SILICONE NEWS from Dow Corning

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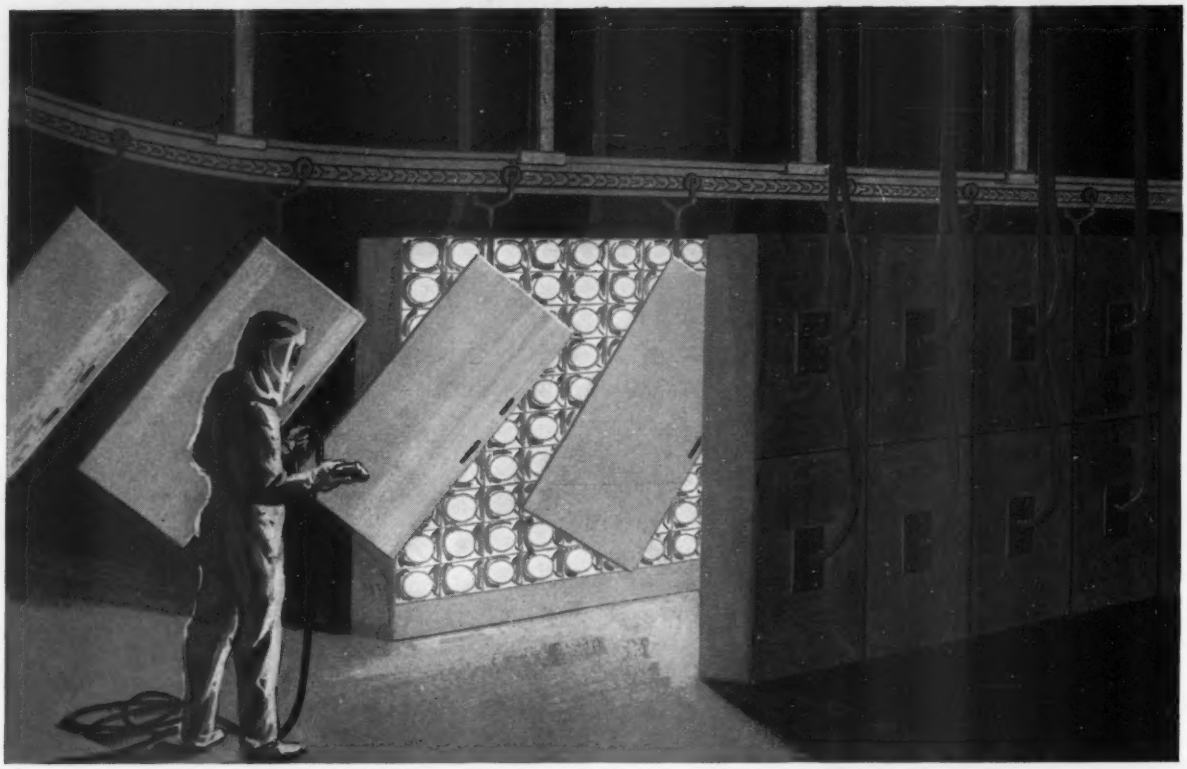

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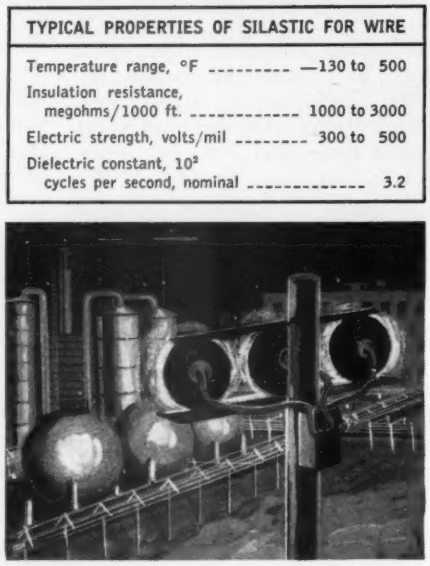
Dielectric constant, 10^2 cycles per second, nominal	3.2



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ing is still somewhat in the development stage, although there are some applications such as shields for protecting the intake areas of jet engines to keep out debris. This material is particularly well suited for the job because of its high degree of abrasion resistance and its strength at elevated temperatures.

* * *

Inconel "700," as wire, is just beginning to develop and a lot of testing will still have to be done. It should be noted that the properties of this alloy may possibly make it attractive for springs that operate up to 1400°F., or as bolting material for use up to 1700°F. retaining a high degree of strength. One of the local aircraft companies has purchased some of this alloy to use as bolting materials at temperatures above 1500°F. This alloy offers numerous possibilities to the designers of high temperature components.

* * *

Inconel "718," the newest of the high nickel alloys, is already being used as welding wire, cold-heading wire, and spring wire. It should be pointed out that these applications are on a very limited basis and are primarily experimental. The extremely high yield properties of "718" offer particularly good opportunities in the rivet and bolt field. As for Inconel "718" being used as spring material, it is not likely that this alloy would have any better properties than Inconel "X."

* * *

Ni-O-Nel has been making great inroads into the field of corrosion resistant materials. Proctor and Gamble have installed three mist eliminators for a glycerin evaporator at Staten Island, and they used Ni-O-Nel mesh. The material that was previously used lasted about two years — Ni-O-Nel is expected to give much longer life. One of the local steel mills is switching to Ni-O-Nel nuts and bolts in their pickling facilities because of Ni-O-Nel's good resistance to sulfuric acid pickling solution at high temperatures and its resistance to stress corrosion cracking. It would appear that this alloy is going to be with us for a long time as a material that is capable of handling not only this acid, but phosphoric acids, nitric acid, and other organic acids. Some of the potential uses of Ni-O-Nel in acid applications are baskets, chains, hooks and bolts.

* * *

For the most part all of these alloys I have mentioned are melted in high frequency induction furnaces and are cast into ingot molds. These ingots are overhauled by milling and are then forged to blooms. The blooms are rolled into billets and then the billets are rolled into rods on the 9″ and 10″ hot mill. At this point the decision as to whether the wire rod will be ground or further hot rolled is based primarily on the alloy and the end use. Inconel "X," "700," "702," "718," etc., are very difficult alloys to hot work, and the hot rolled surface of these alloys is generally poor. As a result of this poor surface the rods are generally hot rolled into straight lengths and centerless ground, then cold drawn to the finished redraw size. Generally it can be said that all of these alloys, being extremely hard, will resist deformation more, and that more powerful equipment is required for cold drawing, bending, coiling, or upsetting. The alloys are all basically heat resistant alloys and have very tight adherent oxides which are difficult to remove simply by acid pickling.

* * *

Inspection of the redraw stock takes place as it is hot rolled. Tests for seam depth and size are run on samples taken from both ends of the rods or coils. There is a visual examination of the surface of the full coil as it is being tied, and the samples previously taken from the ends of the rod are annealed, twisted, and filed for seam depth. This test is based on the assumption that the quality of the coil ends is indicative of the quality of the entire coil. Coil weight in the hot rolled rods runs about 100 lbs. and the centerless ground coils run about 20 lbs. without welds and about 100 lbs. in the welded condition. The mill would be very happy to produce larger coils for redrawing if welding were permitted. However, government specifications do not permit welded coils

(*Please turn to page* 1052)

Cable — World Wide Today

by E. H. Lewis, President
Western Insulated Wire Company
Los Angeles, California

A paper presented at the West Coast Regional meeting of The Wire Association on June 9, 1960, at Los Angeles, California.

I must apologize for coming to a technical session without my slide rule and other equipment, however, inasmuch as my talk is based on a subject which I call "institutional engineering" I figured we could dispense with strictly technical lines.

* * *

Business conditions in the U. S., as well as in the rest of the world, have been changing quite materially since World War I, with accelerated changes in the past five years. I tried to arrive at some basis for a study of the situation after I visited a great many plants in this country where I found that the same conditions, complaints, etc., were pretty universal. There was a constantly growing fear of foreign competition, in addition to the reports of higher costs, less productivity, smaller margins of profit, more regulations, etc. I therefore figured that a review of the foreign situation might throw some additional light on how to improve our position. In the past three or four years I have traveled about 150,000 miles, going to some thirty different countries, visiting industrial plants and exchanging ideas as to methods, labor, production equipment, sales, products, costs, etc. I was primarily interested in wire and cable, but found conditions similar in other industries in respective countries.

* * *

The plants varied from one-man operations in Hong Kong to many thousands of employees in other countries. While they have ingenious methods here and there, the manufacturing is primarily the same as ours. They use similar materials and equipment, a good deal of which is, in fact, American-made. Their labor rates run from seven cents an hour to about sixty cents per hour, but of course their living standards are much lower than ours. This in itself places us at a disadvantage. Their demand and production is lower than ours which offsets some of this low labor. Some of the countries have cartels which helps to eliminate some of our type of competition, and they are permitted to get together and set resale prices. They make a profit and most certainly do not give it all away.

* * *

I did find one important phase of the situation, and that is in labor. Despite their lower wages, their interest in their work and outlook far exceeds ours. The average worker is deeply interested in what he is doing and takes a great deal of pride in the outcome of his operations. They are not as complacent as we and don't rely on "the world owes me a living" and "I only put in my time," etc., etc. Here is where we are failing. We neglect the important fact that showing a man how to run a machine is only part of the job. What do we do to develop an interest? Does the average worker know why his part in industry is so important? Does he know that in making a piece of cable, for instance, that a careless job could mean loss of life and limb? Especially if it is for military equipment? Education to create interest is of major importance.

* * *

Inasmuch as all types of industry are involved, the program could be cooperative — through ads, films, slides, lectures, periodicals, etc. In reality, there are two levers that make a man work: Fear and interest. The latter is by far the most productive.

* * *

Our tariffs can take care of the lower foreign labor cost in many instances; but if we have disinterest — carelessness — more scrap — more complaints, our competitive situation is amplified many times.

Speaking of competition — just what is it? Is it lack of intestinal fortitude, or merely the report of the sales department that lost the order? Merely taking business without regard to cost only aggravates the condition. The theoretical phrase of "contribution to overhead" is merely wishful thinking. I know of one sales manager who issued orders to the effect "I don't care what the other fellow's price is, quote 5% under and get the business." Who is he kidding? I had a case a few years ago where a midwest industrial asked for a quote on a quantity of cable. Our representative called for a price and he was told to quote our printed sheet, which has always been our policy. A few days later he phoned and said we lost the order by 30%. We said we're sorry, but we can't get all the business. About two months later the rep called and said he had another inquiry from the same customer for the same quantity of material. "What should I quote — remember we lost the last one by 30%." He was again told to quote the sheet — whereupon he "blew his top" and said many things beside the fact the he was only wasting time. However, we would not deviate. Low and behold, in about a week we received the order! This time I "blew steam" and phoned him, in that now I wanted to know why he got the order. He called back in a few days and said the P.A. merely smiled and said this was the same inquiry he placed a short time ago and wanted to see if he could crack our price. To save face he waited about sixty days to place it.

* * *

Such conditions occur daily — and I say it should be up to top management to set their prices and not leave it up to anyone in the sales organization who is afraid to do a selling job, and takes the easy way.

(*Please turn to page* 1051)

Lead Base Gear Lubricants

by Robert W. Piper
Western Representative
Brooks Oil Company
Hollywood, California

Mr. Piper showed a motion picture on lubricants in industrial applications, which he amplified in the short talk following it that is published here. The presentation was made at the West Coast Regional Meeting of The Wire Association in Los Angeles, Calif., on June 9, 1960.

Having seen the movie, I am certain we all realize the importance and, in part, the necessity of using Lead Base, Extreme Pressure Lubricants in applications involving enclosed gear drives of Wire Mill Equipment.

* * *

Lead Base Gear Lubricants are an improved product and have certain advantages from the standpoint of performance. To mention a few, Lead Base Gear Lubricants have:

1. **Higher Film Strength: 25,000 psi on Timken Tester.**
2. **They are more Adhesive: Affinity to plate and form a cushion and have a high oiliness index.**
3. **They are water repellant, non-corrosive and provide a protective coating.**
4. **Stability of this product is good having a low oxidation rate and it can be filtered.**
5. **Its low viscosity characteristics permit it to flow freely.**
6. **Finally, it is an approved product for use with anti-friction bearing applications.**

* * *

As a general rule, the grade viscosity of Lead Base Gear Lubricant can be half or less than half of the grade viscosity of conventional gear oils. The reason is attributed to a high film strength at all viscosities which permits use of a low viscosity, free flowing lubricant for reducing fluid friction to a minimum. It is interesting to note that excellent results have been attained in lubrication of bearings enclosed in gear housings.

* * *

Selection of gear lubricants with respect to viscosities indicate a preference for A G M A charts supplied by American Gear Manufacturer's Association as a substitute for SAE charts. The latter is considered to have too wide a viscosity range. It is our findings that all leading Gear Manufacturers are now using A G M A charts, applying grades numerically from 1 to 11 inclusive.

I have here a sample copy of the A G M A chart showing the Saybolt Universal Viscosity and the applied numbers as previously mentioned. This chart will be available to you through the Wire and Wire Products Publication at a later date.

* * *

In Wire Mills today, considerable equipment has been added to wire drawing units. For example, descalers, takeoff blocks, etc. This added equipment imposes greater loads and tooth pressures to the gearing making it mandatory to provide better lubrication.

* * *

In recent years, the design trend of reduction gear sets has produced closer tolerances, higher speeds, greater tooth loads, and anti-friction bearings which has created the need for free flowing, high film Lead Base Lubricant.

* * *

In concluding this talk, I would like to add that I have been closely associated with gear lubricants for many years and I am firmly of the

(*Please turn to page* 1053)

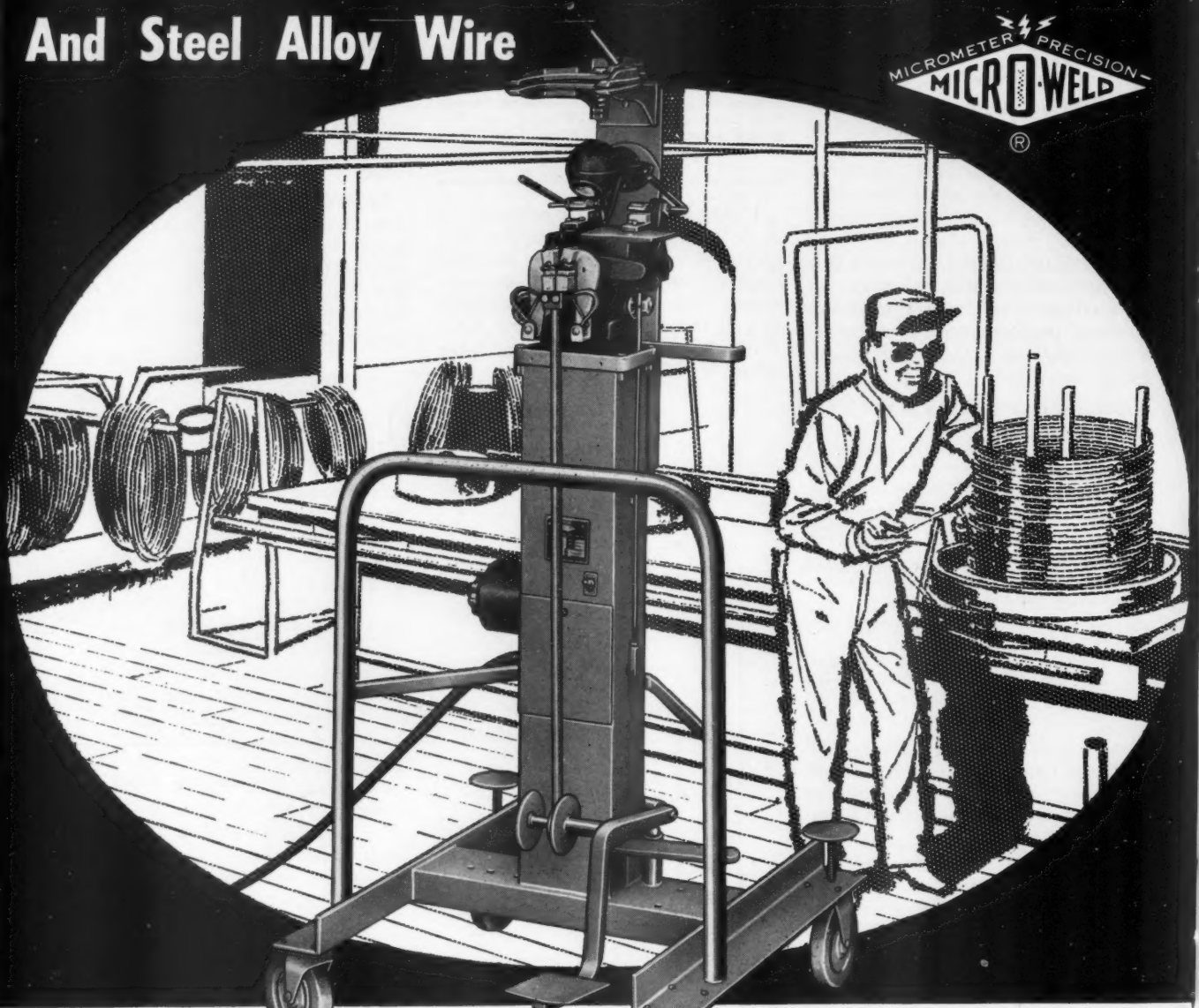
AMERICAN GEAR MANUFACTURERS ASSOCIATION

SPECIFICATIONS

A. G. M. A. NO.	SAYBOLT UNIVERSAL VISCOSITY
1	180/240 @ 100 F.
2	280/360 @ 100 F.
3	490/700 @ 100 F.
4	700/1000 @ 100 F.
5	80/105 @ 210 F.
6	105/125 @ 210 F.
*7 Compound	125/150 @ 210 F.
*8 Compound	150/190 @ 210 F.
9	350/550 @ 210 F.
10	900/1200 @ 210 F.
11	1800/2500 @ 210 F.

Fast Operating Utility Type Models J-3-S & J-4-S Automatic MICRO-WELD Butt Welders For Steel And Steel Alloy Wire

MICROMETER PRECISION MICRO-WELD ®



Model J-3-S and J-4-S MICRO WELD Butt Welders for steel wire.

These welders are used for welding high and low carbon Steel & Steel alloy wire ranging in size from .020" to .160" diameter.

All operations on these units, which include clamping the wire, contacting the weld switch, and applying the upset spring pressure, are made by a single downward stroke of the foot pedal.

Model J-3-S Welder
Capacity .020" to .080" diameter.

Model J-4-S Welder
Capacity .040" to .160" diameter.
STEEL, STEEL ALLOYS,
AND THERMOCOUPLE WIRE.

MICROMETER PRECISION MICRO-WELD ®

MICRO PRODUCTS CO.
20 NORTH WACKER DRIVE
CHICAGO 6, ILLINOIS
Telephone STate 2-7468

The West Coast Regional Meeting in Los Angeles

The Program Committee for the 1960 West Coast Regional Meeting of **The Wire Association** upheld the tradition of our Pacific Coast members' ability to provide an excellent and entertaining two day program. This year's meeting took place on June 9th and 10th in Los Angeles, California.

* * *

Headquarters for the meeting were in the Statler-Hilton Hotel, where 277 persons registered, starting at 11:00 o'clock on the morning of the first day.

* * *

With a quorum of the directors present, the semi-annual meeting of the Board of Directors was held in Los Angeles this year on June 9, before other activities got under way.

The Meeting of the Board

President Dove called the meeting to order and asked **Executive Secretary Brown** to read the minutes of the last meeting. This was followed by the treasurer's report, also by Mr. Brown. Both reports were duly approved.

* * *

Mr. Dove called upon **Mr. Lawson** for comments on Mr. Malo's previous request to have all who attend our various meetings, members and guests, send a letter asking questions on their interests. He stated that the purpose would be to determine the mill activities in which their companies engaged, what part of the program interested them and what subjects would they like to have presented, so that further programs can be built around the information secured. Mr. Brown commented that the attendance usually comprised 60% members and 40% guests and that the past procedure has been to send a letter to the guests requesting them to join the Association, but the questionnaire on the business status of guests could not be sent to guests without specific authorization of the Board.

Joseph F. Conlan
Program Chairman

Mr. Potter moved that the Association spend the money necessary to poll all guests who attended the last four meetings. Mr. Brown said an invitation to join the Association could accompany the questionnaire. A motion to approve this procedure was made, and carried.

* * *

Mr. Lawson was asked for a report on the result of The Electric Wire and Cable Committee's meeting in Philadelphia. This called attention to an important decision that would make each of its 25 members responsible for securing one paper to be used at regional and national meetings during each year.

* * *

Mr. Brown then gave the tellers' report on the result of the favorable mail ballot to change Article 3, Section 4 of the By-Laws to permit no more than two men from the same firm or parent company to hold office in the Association, provided they come from widely separated parts of the country.

* * *

As to the status of the 1960 Convention papers, Mr. Brown reported that word had been received from **Mr. Stendahl** that the Ferrous Program was complete, that **Mr. Yokelson** would have his electric wire and cable program report in soon, and that no advice had come in regarding the Non-Ferrous program.

Mr. Dove then brought up the question of the appointment of nominating committees for officers, directors and the Executive Committee. He named for the Nominating Committee for Officers, Directors **Potter,** (Chairman), **Dull, Malo, Sanderson,** and **Schmid.** For the Nominating Committee for Directors, he appointed Directors **McShane** (Chairman), **Potter, Spaulding,** and **Yokelson.** For the Nominating Committee for the Executive Committee, Directors **Mackay** (Chairman), **Craig, Higginbottom, Mohr,** and **Williams** were appointed.

* * *

At this point the Chairman suggested the setting up of a Papers' Management Committee for the Ferrous and Non-Ferrous Divisions similar to that organized for the Electric Wire and Cable Section. It was moved that such committees be appointed. The motion was approved.

* * *

Mr. Worth's suggestion of having the next president serve for one year and thereafter to have the office alternately held by Ferrous and Non-Ferrous men was next considered. A motion was made and passed that this arrangement be followed.

* * *

The next point on the agenda was the program to be followed in 1961 at French Lick, Indiana, the dates for which are October 23-26. **Mr. Sanderson,** appointed to serve as General Program Chairman, was asked to bear in mind that there could be no plant inspection trips.

* * *

The location of the 1962 Annual Convention was discussed and Baltimore decided upon, with Pittsburgh as an alternate in case satisfactory arrangements could not be made at Baltimore.

* * *

Mr. Dove also stated that the Executive Committee had agreed to extend the contract of the As-

sociation with the Quinn-Brown Publishing Corporation (Wire and Wire Products) for another period of five years from 1962 to 1967. A motion to ratify this action of the Executive Committee was made, put to vote and unanimously carried.

* * *

A motion by **Mr. McShane,** seconded by **Mr. Schmid** to approve the acts of the officers for the period from October 1, 1959, to April 1, 1960, was also passed.

* * *

President Dove also noted that the Awards Committee report, normally to be approved at this meeting, would have to be approved later by the directors, due to differing opinions on the Non-Ferrous Medal Award.

* * *

Following this discussion the meeting was adjourned.

The Technical Session
2 P.M., June 9, 1960

Clyde Wilson, Wire Sales, Pacific Coast Division of **Bethlehem Steel Company,** and **R. Ward Dobbins,** Purchasing Agent for the **Simmons Company** served as Moderators for the session.

* * *

The first presentation was "Lead Base Gear Lubricants," a combination of a talk and motion picture, "The Brooks Oil Story," by **Robert W. Piper,** Western representative for **Industrial Compounds Company** and **Brooks Oil Company.**

* * *

Ray Hulen, Chief Engineer, **Whitacre Engineering & Manufacturing Company,** followed with a paper on "How Deadblocks Increase Wire Mill Production," a timely subject considering the great interest in this new production tool.

* * *

An interesting paper was presented by **E. H. Lewis,** President of **Western Insulated Wire Company.** It was entitled "Cable-World Wide Today."

* * *

Last, but not least, in the technical portion of the session was a fine paper "The New Nickel Alloys Wire for Special Applications," which **Kenneth P. Brown,** Commodity Specialist of **Pacific Metals Company Ltd.,** ably presented.

* * *

The session closed with the showing of a sound-color motion picture, "The Story of Cerro Bolivar," which depicted the ore mining operations at Bolivar, Venezuela. The film was provided by and shown through the courtesy of the **Columbia-Geneva Steel Division** of the United States Steel Corporation.

Friday, June 10, 1960
Plant Visitations

First on the day's program was a visit to the plant of the Los Angeles Division of the **American Brass Company** in nearby Paramount, for which busses left the hotel at 9:30 A.M.

* * *

This plant, the West's newest mill for copper and brass products, was recently erected and equipped at a cost of some $18 millions.

* * *

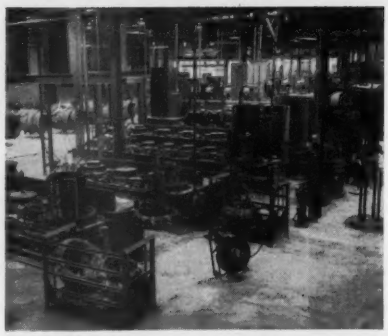
The plant has seven acres of floor space under one roof, where copper and copper alloy sheet, strip, rod and tubing are manufactured. Visitors were able to see billet heating, drawing, piercing, heat treating and all the incidental material handling and other operations. Rods, of particular interest to wire men, are produced on a new Loewy-Hydropress extruding machine. Operations involved such other equipment as saws, drawing blocks, straighteners, etc. The primary rod line produces leaded brass, yellow brass, and commercial and phosphur bronze, which is extruded into rod ranging for 1/10" to 3½" in diameter in rounds, hexagons, squares, and other shapes.

* * *

After the tour, the group was transported to the **K. H. Davis Wire & Cable Company's** new plant, where they were served a fine luncheon through the company's generosity and courtesy.

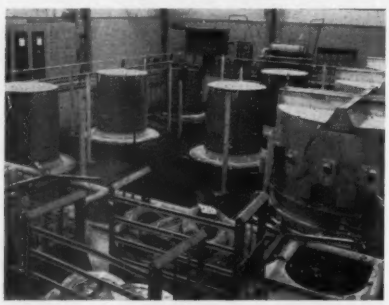
* * *

About 2 P.M., the tour through the fine new plant got under way, giving the group an opportunity to see much new equipment used for drawing wire and manufacturing wire rope.



General view of wire drawing department of K.H. Davis Wire & Cable Corp. plant. * *

Wire patenting line-K.H. Davis Wire & Cable Corp. plant. * * * * * * *



Annealing department in K.H. Davis Wire & Cable Corp. plant. * * * * *

The Cocktail Hour and Dinner

From 6:30 to 7:30 P.M. those in attendance were provided with refreshments, with entertainment by **Dorothy Ray,** the talented accordionist, whose services were supplied by **E. Jefferson Crum** of the **R. H. Miller Company.** This "hour" was sponsored by the **Pacific Coast Division, Bethlehem Steel Company; The Colorado Fuel & Iron Corporation; the Columbia-Geneva Steel Division, United States Steel Cor-**

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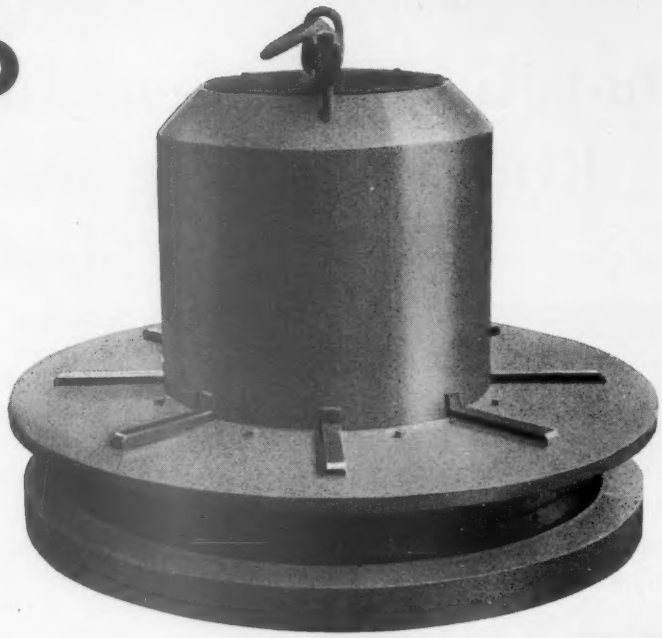
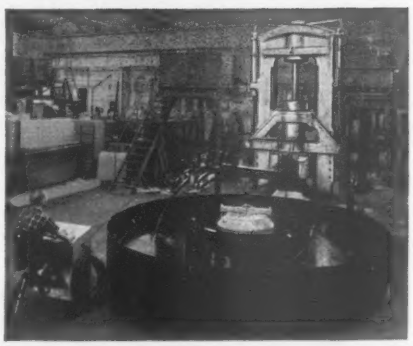
KRUPP

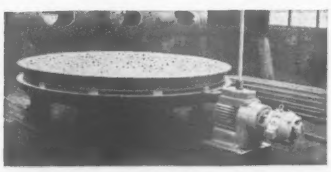


Model TWK (T) Combination Take-Up and Pay-Off

Portable design with infinitely variable speed, adapted for remote control.
Available with rapid-stop brake.

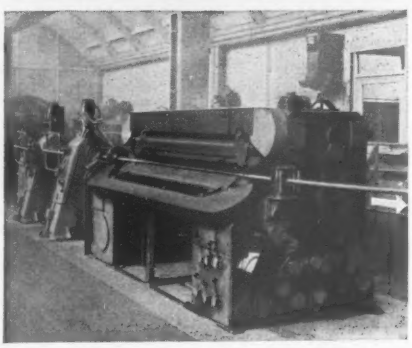


Combination take-up and pay-off used to feed a lead and aluminium cable sheathing extruder



Model TWK (S) Stationary take-up

Model BWK (S) Steel rope coiler



Combination take-up and pay-off used as take-up behind a stranding machine with caterpuller

FRIED. KRUPP MASCHINEN- UND STAHLBAU RHEINHAUSEN · GERMANY

For information, please contact Krupp International Inc., 375 Park Avenue, New York 22 N.Y.

Installation of a Semi-Automated TW Wire Extrusion, Coiling and Boxing Facility in a Medium Sized Wire Plant

by David Barr
Plant Engineer
National Electric Division
H. K. Porter Company, Inc.
Ambridge, Pennsylvania

Early in 1959 the National Electric Division of the H. K. Porter Company initiated a cost reduction program encompassing the two most popular building wires which it produces, TW and non-metallic sheathed cable.

* * *

Although many companies have undertaken similar programs, this effort was slightly different than most since it was based on an analysis of the step-by-step method used in the manufacture of each of these product lines. Ground rules, stipulated by management, were that all expenditures made to improve manufacturing efficiency in any of the component operations must be justified only by the TW or non-metallic sheathed cable using that particular facility. Therefore, in effect, any other construction utilizing this piece of equipment would be getting a "free ride."

* * *

Coupling these ground rules with the now accepted management philosophy of short payoff times, dictated that careful consideration be given each equipment acquisition or modification since it could only be paid for by each of the two subject product lines passing through it.

* * *

After several detailed studies were made of each manufacturing sequence, it was deemed advisable to break both of these programs down into 13 individual and distinct projects. It is upon one of these that I wish to speak to you this morning. This project, one of the most interesting of the entire program, was the planning and installation of a competely new TW coiling, and boxing operation, to be integrated with an existing dual purpose 4½ inch TW and non-metallic conductor extrusion line.

David Barr

This paper was presented at the Regional Meeting of the Electric Wire and Cable Section of The Wire Association on May 5, 1960, in Philadelphia, Pa.

Mr. Barr graduated from the University of Pittsburgh in 1948 with a degree of B.S. in Mechanical Engineering. He was closely associated with both heavy and light industrial steel fabrication with the American Bridge Company and the H. H. Robertson Company before joining the Wire and Cable Section of the National Electric Division of H. K. Porter Co. five years ago. In March, 1960, he was made Plant Engineer of the entire division. He is a member of the Management Committee of the Electric Wire and Cable Section of The Wire Association.

* * *

A careful analysis of our costs on the relatively simple TW construction showed that in each of the 3 principal sizes that was coiled and cartoned, over 45% of the total direct labor cost was consumed in recoiling and boxing. Our first slide will illustrate that this was indeed a field ripe for improvement.

* * *

As you can observe, assuming our total direct labor costs to be one hundred percent, our labor costs for post extrusion operations were 42.5%, 50%, and 45.2% for sizes fourteen, twelve, and ten respectively.

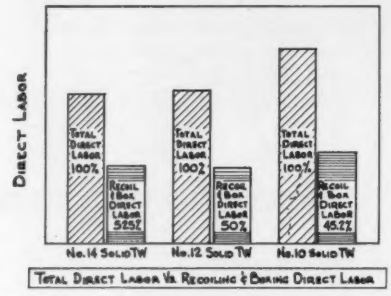

DIRECT LABOR
TOTAL DIRECT LABOR 100%
RECOIL & BOX DIRECT LABOR 42.5%
TOTAL DIRECT LABOR 100%
RECOIL & BOX DIRECT LABOR 50%
TOTAL DIRECT LABOR 100%
RECOIL & BOX DIRECT LABOR 45.2%
No. 14 SOLID TW
No. 12 SOLID TW
No. 10 SOLID TW
TOTAL DIRECT LABOR VS. RECOILING & BOXING DIRECT LABOR

Figure 1. * * * * * * *

* * *

At the inception of this program, we had definite knowledge that a completely automatic extrusion - to - palletizing arrangement was in use by several of our largest competitors; this was of course the ultimate solution insofar as an engineering approach was concerned. At the other end of the manufacturing spectrum was the method we were utilizing, that is, a separate extrusion, recoiling and box-palletizing sequence of operations. Also, two indirect labor charges were involved in the movement of the in-process wire from one operation to another. This was due to the familiar wire industry problem of antiquated layout which, in our plant, located these operations sufficiently far from one another so as to require forklift service.

* * *

Cost studies quickly showed us that in order to justify the very large expenditure for the fully automated extrusion-to-palletizing method of manufacture, we should

have at least 6 to 8 extrusion lines producing TW on a continuous basis.

* * *

Since our existing sales volume of TW wire, however, was in the 1 to 2 extruder category, it was soon obvious that we could not present to management a payoff time sufficiently attractive to justify this near six-figure expenditure. Instead, it became apparent that our circumstances would require a continuous semi-automated line which, while partially utilizing man-power instead of machine power, would non-the-less substantially out-produce our existing method of manufacturing. In order to accomplish this objective by a semi-automatic method, it was agreed by the Plant Engineering and the Industrial Engineering Departments that a maximum crew of two men should be utilized in place of the four men then involved. These two men should at least equal and if possible exceed, the output of the existing two man separate coiling operation in addition to performing the extrusion and boxing operations; and finally it was agreed that all in-process material movement must be eliminated.

* * *

One principle which was agreed upon at the start, was that the integrated line, once set in motion, must be continuous. No down-time for reel changes, coil or pallet removal, etc. could be tolerated. In short, the production efforts of the operators would be controlled by the efficiency of the line rather than the reverse being the case.

* * *

With this thought in mind, our first problem was to insure continuous operation on the existing extrusion line. This was accomplished by the installation of a model DM-30 dual-carriage flipper-type payoff manufactured by the Entwistle Company of Providence, Rhode Island. This unit replaced two rotating-reel type payoffs. Previously, when each supply spool of bare copper was fed to the extrusion line, a down-time period of 6 to 8 minutes was required for change-over; installation of the flipper type payoffs accomplished our first objective of making the operation continuous, and in addition, provided a ten percent production increase at the same line speed.

* * *

We then moved to the opposite end of our extrusion facilities and for some time pondered the questions facing us here. We knew, of course, that the prime piece of equipment required in the proposed line, would be an automatic high speed dual head coiler. There were several continuous high speed reel-type takeups on the market; it was hypothesized that the development of a machine to continuously and reliably put up five hundred foot coils instead of filling steel process reels, should not be too difficult.

* * *

The Plant Engineering Department, in conjunction with an outside engineering firm, the Lombard Corporation of Youngstown, Ohio, who had been retained to assist in both the TW and non-metallic programs, drew up rough specifications of the machine which would be required. It must be a dual head continuous unit which could quickly and accurately cross over from one rotating head to another. The machine would have to automatically present to the operator the completed coil for cartoning, tightly wound with no loose ends, at line speeds up to 1500 F.P.M. Its operation necessarily had to be automatic enough so the operator would have time to complete possibly two, and at most three, simple operations in the twenty seconds of internal time between finished coils.

* * *

With these rough objectives in mind, the Industrial Equipment Company, sales representative for the Entwistle Company, was called in for consultation and, after some engineering studies, agreed to undertake the task of manufacturing this unit. The result is the Entwistle TC-24 dual head automatic continuous coiler.

* * *

While this unit was being manufactured, additional engineering effort was directed toward operations remaining in order to provide the original objective; that is a bare-copper-conductor to completely-cartoned-and-palletized TW product ready for shipment, in a single operation. In order to accomplish this, it was necessary to install such auxiliary equipment as a paraffine application tank, an in-line spark tester, a box closing device, an automatic stapling unit, and suitable run-out tables. Each of these units can be seen on the next slide.

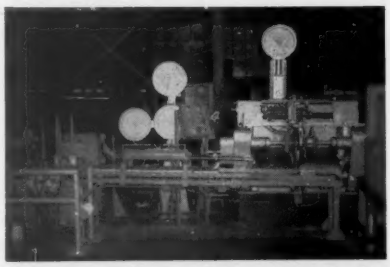


Figure 2. — Take-up end of subject extrusion line.

Each of the components was individually purchased or fabricated, tested and installed with as little interference to normal production as possible. For this reason the development and installation of this completed line consumed approximately eight months.

* * *

The "heart" of the coiling operation is, of course, the dual head continuous coiler itself. This unit is an electrically driven, dancer-potentiometer controlled, continuous coiler. All operations such as head swing out, head collapse, and wire traverse are automatically pneumatically actuated. In case of malfunction however, manual controls are provided for out-of-phase head swing-out and return, short coil crossover, counter reset, and emergency stop. The emergency stop has in turn been connected to a two-position switch which can either bring to an immediate stop the coiler itself or the entire extrusion line.

* * *

The coiler is further provided with infinitely variable traverse adjustment and traverse speed controls as well as electrical switches with which to unlock the individual heads from the dyna-spede clutches to which they are normally engaged.

* * *

The coiler will accommodate TW wire in conductor sizes up to No. 8 solid and satisfactory results have been attained in trial runs of speeds up to 1500 feet per minute on No. 12 and 14 wire. All sequen-

tial operations such as the start up of the empty coiling head, the cross over, cutting operation, head swing out, and head collapse are automatically timed and leave the operator only the functions of preparing the box, dropping the completed coil into the carton, and shoving the full box along the conveyor table in the direction of the specially designed quadruple head stapler.

* * *

Auxiliary operations such as Underwriter's label application, and carton palletizing are the responsibility of the line operator. It is worthy of note that while all of the line operators responsibilities are internal, none of them must be performed on a split-second schedule. Close studies by our Industrial Engineering Department indicated that all of these internal operations could be handled by the line operator once the line extrusion itself was made continuous.

* * *

Conversely, the coiler operator, whose schedule is rigidly controlled by the sequential operation of the line, must be relieved of as many details as possible. For this reason, only the basic actions necessary to make the box, fill it, and present it to the stapler were allocated to the coiler operator. Early experimental attempts to have the coiler-operator re-close the coiling head by means of a foot switch, demonstrated how important it was to simplify, and if possible eliminate, all unnecessary actions at this station. A novel switch and tilting carton arrangement, conceived by the project engineer assigned to the installation, removed all responsibility from the operator for holding the box and returning the stationary head to a closed position in time to effect a crossover before the rotating head was full. The tilting of the full carton to a horizontal stapling position automatically triggered the head-return mechanism.

* * *

Several normally manual operations were designed to occur automatically in conjunction with the coil-removal and boxing operation, and when these responsibilities were removed from the coiler operator, it was found that he could quite easily keep up with line speeds of 1,000 ft. per minute, the maximum speed at which our extrusion lines are now capable of operating commensurate with a quality product.

* * *

Additional new auxiliary equipment, now on order, will increase these operating speeds by approximately twenty-to-thirty percent. At this speed, the man operating the continuous dual head coiler will remove, carton, and staple a 500 ft. coil of TW wire every twenty-three seconds. Experimental runs to date have proven that these speeds are feasible. Since no operator can pace himself at this rate indefinitely, however, the line in question has been set up as a two man team, with the line-operator and the coiler-operator exchanging jobs every twenty to thirty minutes. Personal time relief is provided by the utility man assigned as helper for the entire plastic extrusion department.

* * *

Several simple design considerations have kept this line completely flexible. In less than fifteen minutes the two-man TW production line can be changed once more to a basic one-man non-metallic sheathed conductor extrusion facility. This flexibility is of paramount importance where production runs are relatively short and a single line must serve a dual purpose.

* * *

After approximately two months of operation on the new line, we have made a preliminary evaluation of our production costs for the cartoned sizes of TW wire. A quick survey of our third slide will illustrate the results.

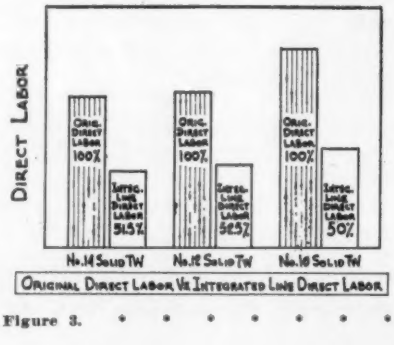

DIRECT LABOR
ORIG. DIRECT LABOR 100%
INTEG. LINE DIRECT LABOR 51.5%
ORIG. DIRECT LABOR 100%
INTEG. LINE DIRECT LABOR 52.5%
ORIG. DIRECT LABOR 100%
INTEG. LINE DIRECT LABOR 50%
No. 14 SOLID TW
No. 12 SOLID TW
No. 10 SOLID TW
ORIGINAL DIRECT LABOR VS. INTEGRATED LINE DIRECT LABOR

Figure 3. * * * * * * *

Assuming our original direct labor costs to be one hundred percent, you will note that on the three sizes being produced on this revised extrusion and packaging line, direct labor costs have been reduced between 47.5 and 50 percent. Since all operations have been confined to a single department, the decrease in burden costs are also quite substantial, and the indirect labor involved in moving the in-process material from one operation to another has been completely eliminated.

* * *

Our total capitalized expenditure for the new facility will be paid back in approximately nine months.

* * *

In conclusion, I believe that this particular project has had a secondary benefit not originally anticipated. This is the growing realization that complete automation is not the answer to all production problems. In many cases, the application of automation principles, automatic equipment only where justified, and the common-sense utilization of available manpower will provide the answer to many knotty manufacturing problems which, on their own, will not support the high costs of a completely automated solution.

* * *

We at National Electric believe 100% push-button production most certainly has its place in the wire and cable industry; but where it cannot be justified, much progress can be made by applying the principles that I have described to you this morning.

TO SELL—

Advertise in

WIRE AND WIRE PRODUCTS

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453 MAIN ST., STAMFORD, CONN.

Controlling Crosstalk in Cable Stranding

Donald J. Vanderweel
Planning Engineer

and

R. Gillis
Department Chief

Tonawanda Plant
Western Electric Company
Buffalo, New York

A new component of production machinery developed at the Tonawanda Plant is simplifying the manufacture of Inside Wiring Cable. The improvement was made by the addition of a device which oscillates the various units of multiple unit cables to prevent parallelism of pairs in one unit with adjacent pairs in other units.

* * *

Multiple unit cables are produced on a rotating take-up strander which takes twisted pairs of wires from reels, binds them with cotton color coding binder into units, and strands two or more units into cable. (Fig. 1 — Tonawanda Strander)

Figure 1. — Strander-cabler for Inside Wiring and Switchboard Cables having up to 6 units or 312 conductors.

In order to keep crosstalk between pairs to an acceptable level, it is necessary to use different twist lengths, (the distance required for a complete twist) in adjacent pairs, because of the close parallel arrangement of the pairs in the cable.

* * *

In the past, control of crosstalk necessitated the use of different twist lengths in the outer layers of units, since the units are also parallel and crosstalk could occur between pairs of adjacent units. The introduction of a method for oscillating the face plates, which guide the wires into the unit binder, has eliminated the need to have the units differ. (Fig. 2 — Tonawanda Oscillator) The chain driven face plates oscillate approximately 360° for not less than 150 feet or more than 300 feet of cable, to meet the varying requirements of different types of cable. This oscillation continually moves the conductors in one unit with respect to the conductors in adjacent units, preventing any parallelism. It is now possible to use the same paired twist lengths in the formation of all units, resulting in a reduction in the number of piece parts (pairs with differing twist lengths) from 58 to 29.

D. J. Vanderweel (Left)
R. Gillis (Right)

This paper was presented on May 5, 1960, before the Regional Meeting of the Electric Wire and Cable Section of The Wire Association in Philadelphia, Pa.

Mr. Vanderweel holds a degree of B.S. in Industrial Engineering from the University of Buffalo that he received in 1958. He has been employed by Western Electric Company since 1946 and presently is concerned with the stranding of switchboard and inside wiring cables.

Mr. Gillis graduated from Iowa State University with a degree of B.S. in Electrical Engineering. He joined Western Electric in 1924 and has worked on magnetic materials, non-ferrous metals, lead and corrugated metal sheathing of cables, plastic molding, machinery procurement, and quartz crystal manufacture. At present he is Department Chief — Engineering — Cable, Textile Insulated Wire, Magnet Wire and Planning Control.

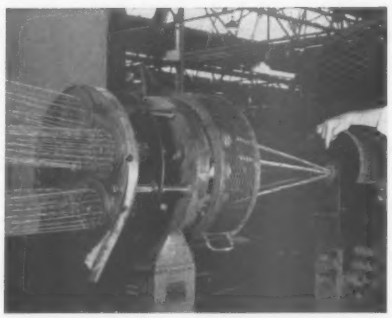

Figure 2. — Multiple unit binder equipped with oscillating face plates for strander-cabler per figure 1.

* * *

In addition, these face plates tend to increase the amount of cable output obtained from each load of supply reels. Formerly, those reels supplying wires, which were located on the outside of the cable, became empty before the other reels, because the outside portion of the cable consumed the wire at a faster rate. However, the new oscillating face plates prevent any pairs remaining on the outside so that wire consumption on all reels is about equal. Thus, a greater length of cable is produced before a reel is exhausted and the amount of wire left on the other reels, after a run is completed, has been substantially reduced, resulting in economies of material.

* * *

The oscillation of the unit face plates also makes possible the combining of the stranding and cabling operations in the manufacture of exchange area cables, which likewise require a low level of crosstalk. Prior to this development, it had been considered necessary to make the units in one operation and to rely on the cabling operation to provide a random positioning of the units with respect to each other to reduce crosstalk. (Fig. 3 — Flyer Strander) (Fig. 4 — Cabler)

* * *

This principle of oscillating the face plates to control crosstalk is being used at the Omaha Plant on the strander cablers in the manufacture of all unit type Switchboard and Inside Wiring Cables. These cables have up to 6 units or

(*Please turn to page* 1047)

Program Notes on the

ANNUAL CONVENTION of the WIRE ASSOCIATION

November 14-17, 1960, La Salle Hotel, Chicago, Ill.

FERROUS PROGRAM

Mechanical Descaling — Dies, Lubricants, etc.
Phosphate Coatings, Extrusion, Cold Heading and Wire Drawing
Methods for Setting Incentive Rates
Planning and Scheduling in a Wire Mill
Dies for Drawing Coated Wire
Fine Wire Packaging and Dead Blocks
Blast Cleaning vs Batch Pickling
Stream Pollution
A New Weld Wire Machine
Cold Extrusion
The Theory of Wire Straightening
Plant Inspection Tour of Republic Steel's Wire Mill

NON-FERROUS PROGRAM

Heat Treatment of Wire
Carbon Block Brazing of Stranded and Solid Copper Wire
Copper Rod and Wire Mill Scrap and Losses
Gasses in Metals
Fabrication of QMV Beryllium Copper Wire
Controlled Distortion of Wire
Some Factors Influencing the Performance of Non-Ferrous Wire Drawing Lubricants
Modern Developments in the Control of High Speed Low Tension Reeling Equipment
Abrasives and Their Use as Applied to Wire Drawing Dies
Some Observations on Copper Alloy Extrusions
Properties and Applications of Some Specialty Wires
Resistance Annealing

ELECTRIC WIRE AND CABLE PROGRAM

Fluidized Bed Process for Insulating Wire
Properties and Processing of Ethylene Copolymers for Wire and Cable
Manufacture of Tinsel Conductor and Cords for Telephone Use
Aluminum Cable Sheathing by Direct Extrusion
New Developments in Wire Coating Materials
Continuous Casting Process for Aluminum Rod
Color Applications in the Wire and Cable Industry
Wire and Cable Materials and Extrusion
Effects of Water Borne Impurities on the Insulating Resistance of PVC Insulation Materials
Plant Inspection Tour of Western Electric's Hawthorne Works

* * * * *

The foregoing paper lists are tentative and not final. More complete lists will be published later.

* * * * *

MAKE YOUR PLANS NOW TO ATTEND THE CONVENTION

THE WIRE ASSOCIATION

RICHARD E. BROWN, Executive Secretary

453 MAIN STREET **STAMFORD, CONN.**

Capabilities of Qualified Technical People in the Older Age Group

by Richard Bliss
Vice President
Mohawk Development Service, Inc.
Schenectady, New York

A paper presented at the Regional Meeting of the Electric Wire and Cable Section of The Wire Association on May 5, 1960, in Philadelphia, Pa.

Mr. Bliss graduated from Clarkson College in 1943 with a degree in mechanical engineering. He spent 16 years with the General Electric Company, first as an engineering trainee and then as a design engineer in the Industrial Heating Department, working on wire enameling machines and doing application work in the copper and brass industries. He joined Mohawk in 1959. The company specializes in wire processing equipment and does custom designing.

Vast sums of money are spent in recruiting and training technical workers for industry and still there seems to be a shortage of qualified help in this area. Where, then, can management turn for manpower to accomplish its goals?

* * *

Consider the older age group. These people can solve many a manpower problem profitably if their skills are properly utilized.

* * *

There are people in the older age group who want to work and who have the ability to produce, but who are sitting idle. These are people who have been retired at age 60 or 65 under the terms of their company's pension plans. Frequently they are older people who have been retired involuntarily by special situations, for instance, by a decentralization move so prevalent these days. These are people who in spite of the years retain their mental abilities, their manual skills, and, above all, retain their desire to be useful. We call these persons the active retired people.

* * *

These people can be extremely valuable. They all have in common that special ingredient called experience. That such people must be put on the shelf involuntarily is an extravagance that our country and our times cannot afford. We are on the threshold of tremendous industrial expansion in the years of the immediate future and such an expansion and increase in prosperity will demand that we use every skill and facility and experience at our disposal.

* * *

Our company specializes in utilizing the skills and experience of qualified technical people in the older age group to produce useful and profitable functions and services to industry. Mohawk was founded in 1947 by a group of retired engineering and business executives in Schenectady. From 1947 until 1959 Mohawk conducted a profitable design and drafting service using almost exclusively retired technical persons.

* * *

Last year Mohawk recognized the opportunity to be achieved in utilizing active retired persons other than technical engineering and drafting talent. There are people in our area admirably qualified in manufacturing, marketing, and other functions associated with industrial production. To utilize these skills, Mohawk was reorganized as a manufacturing operation offering to industry a complete service specializing in design and manufacture of special machinery and development of prototype and preproduction models of new products. In addition to continuing Mohawk's previous designing and drafting service, we have added a manufacturing service where we manufacture to our customer's designs and we have added a selling and distribution activity handling other products on an agency basis.

* * *

Mohawk can take on these responsibilities easily because we can obtain the services of qualified people. Many of them have been national and world leaders in their fields. Recruiting expenses are nil for we have a current list of some 150 people to draw on as we develop the demand for their services. Training and indoctrination is not a problem when we have secured a person for the work with which he is familiar. Our supervision needs are minimal for many of these people know just how to go about establishing and maintaining good work standards for themselves.

* * *

Not all of these things are possible with active retired persons alone. Often physical limitations limit the efforts of these people. Of these, endurance and stamina are the qualities that show up in limited supply most frequently. Accordingly Mohawk has adopted the policy of using younger people in the organization. We try to pair off younger and older people with each other, the older man applying experience to the task, the younger man taking the heavier burden, and, incidentally, gaining experience himself. We believe that the invaluable experience of the active retired persons, coupled with the drive of the younger age group, provides us with a well balanced organization uniquely suited to the requirements of our business.

* * *

Here are some examples of accomplishments achieved by Mohawk in the utilization of the active retirees.

* * *

In our custom machinery business, we specialize to a considerable extent in designing and building machinery for the wire industry. Late last year, in November, we took on a job for a large wire enameling machine to coat wire up to 100.000 sq. mils cross section area. When we started we had no

(*Please turn to page* 1045)

NOW is the Time to Plan for YOUR

CONVENTION ISSUE ADVERTISING

in the

OCTOBER WIRE AND WIRE PRODUCTS

The Annual Convention of The Wire Association, to be held in Chicago, Ill., at the LaSalle Hotel, will be officially represented by Wire and Wire Products' October Convention Issue.

Advertising in the October Issue represents the ultimate of advertising value:

- GREATLY INCREASED READER INTEREST
- LONG LIFE — WIDELY READ AND REFERRED TO FOR ITS CONVENTION PAPERS
- CONTAINS COMPLETE CONVENTION ACTIVITY INFORMATION
- CONVENTION TECHNICAL PAPERS PRE-PRINTED IN THIS ISSUE
- EXTRA CIRCULATION
- EXTRA PUBLICITY VALUE

Whether you are a regular advertiser or a prospective one, if you sell to the wire industry here or abroad, this is your opportunity to bring your sales story to the attention of your customers with great effectiveness.

———— • ————

EXHIBITS IN 1960

Arrangements have been made with the LaSalle Hotel to have one exhibit room where those desiring to show equipment may have space. This room will be divided into 40 booths, each 6' x 8' in size, costing $96.00 per unit. More than one booth unit may be arranged for. Table and chairs will be provided.

Reservations and arrangements for exhibit space should be made thru the office of Wire & Wire Products. Space will be allotted in the order received up to the limit of the space available.

Heretofore, it has been necessary for those with products to show to exhibit in various rooms scattered about the hotel. With this arrangement all exhibits will be gathered in one location for the convenience of your visitors, assuring greater attendance.

———— • ————

Advertising forms for advertising close on September 10 for October. If you do not have a rate card, please write today for a copy. It gives full information on space costs, sizes, color, and so forth.

WIRE AND WIRE PRODUCTS

J. Edward Donnellan, Vice President

453 MAIN STREET **(Tel.: DAvis 3-0482)** **STAMFORD, CONN.**

Automatic Test Equipment for Communication Cable

by

Harvey N. Aviles
Department Chief

and

Robert E. Murphy
Engineer

Test Equipment Development and Design Engineering Department
Baltimore Works
Western Electric Company
Baltimore, Maryland

Introduction

It is the function of final inspection testing to determine by measurement the quality and reliability of the billions of conductor feet of cable produced annually by Western Electric.

* * *

Existing methods of cable testing involve the use of several separate manually operated sets. This requires a connection and disconnection for each measurement, translation of the result to printed form by the operator, and product handling between the various tests.

* * *

The idea of automatic test equipment for communication cable was conceived with two objectives in mind; cost reduction, and improved reliability of testing. This is accomplished by eliminating time consuming handling and connection and disconnection, replacing manual operation and recording by automatic instrumentation, and reduction of human decision to a minimum.

General Description

Developed and built for our Polyethylene Insulated Conductor Cable Shop is a test set for measuring the characteristic parameters of this product. It consists of the following basic units which are contained in Figure 1.

1. Switching relay section.
2. Test sequence programmer.
3. Testing circuits section.
4. Readout device.

* * *

The testing circuits section is divided into sub-assemblies for the measurement of the following parameters:

1. Direct current conductor resistance.
2. 900 cycle capacitance unbalance.
3. 60 cycle mutual capacitance.

H. N. Aviles R. E. Murphy

This paper was presented at the Regional Meeting of the Electric Wire and Cable Section of The Wire Association on May 4, 1960, in Philadelphia, Pa.

Mr. Aviles, who made the presentation, received his B.S. degree from the U.S. Coast Guard Academy in 1942. The next four years were spent in convoy and anti-submarine duty in the African and North Atlantic theatres of war. He joined Western Electric in 1946 and was promoted to his present position in 1959.

Mr. Murphy received a Bachelor of Engineering degree from Johns Hopkins University in 1955. After a period of military service he joined Western Electric Company in 1957.

Figure 1. * * * * * * * *

The test sequence programmer will actuate relays in the switching relay section to connect a conductor, or combination of conductors, to any of the testing sub-assemblies. The resulting measurements are then printed sequentially by a special recorder. The testing cycle is controlled by relay timing, and in the case of bridge measurements, by the time required to attain balance.

Detailed Description

A block diagram of the automatic cable test set is shown in Figure 2. Prior to testing, the conductors of a cable are connected separately to clips on the hook-up panel. Initiation of the test cycle starts the relay timer, and advances the programmer to its first position. The programmer then actuates switching and test selector relays to select the conductor or combination of conductors to be tested and connects them to the proper testing circuits.

* * *

The three tests involve the direct measurement of characteristic values by servo-driven self-balancing bridges. An unbalance in a bridge network momentarily causes an interruption in the relay timing cycle. When a condition of balance is achieved, the cycle timer resumes operation, transmits a pulse to the recording device which prints the information delivered by the bridge and advances the programmer to the next position, thus completing the test cycle.

* * *

The cycle timer advances the test until the required number of conductors have been checked; hence, a permanent record of the

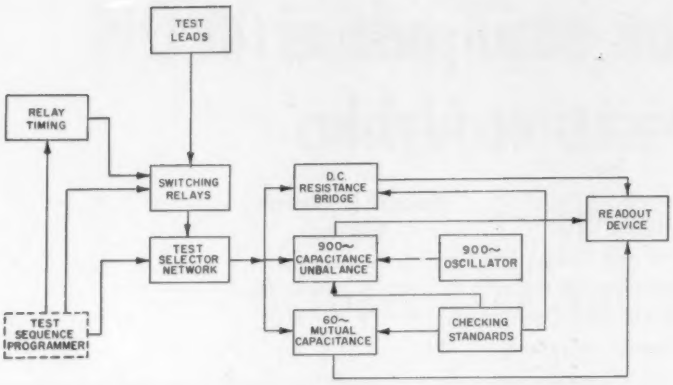

Fig. 2 - Block diagram of the automatic communication cable test set

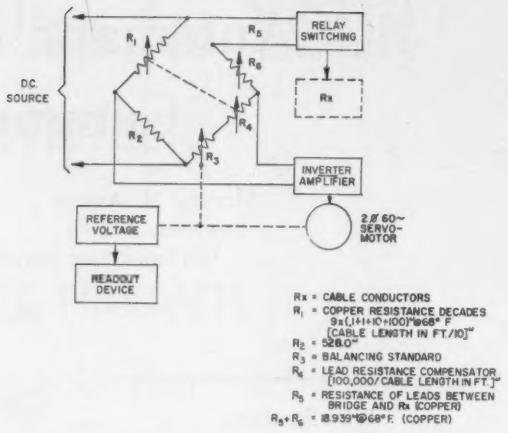

Fig. 3 - D.C. Resistance Bridge

measured characteristic values of each conductor within the cable tested, is provided.

* * *

Checking standards are provided for each of the testing circuits. They are connected internally to the terminals of their respective circuits through pushbutton switches by the test set operator, who checks the calibrations and makes any necessary adjustments in zero, and limit controls.

Testing Circuits Section

The DC Resistance Bridge

The resistance of individual cable conductors is measured with a special Wheatstone Bridge, so constructed as to automatically compensate for measurements of copper conductors at ambient temperatures other than a base of 68°F. This is accomplished by means of a copper ratio arm R_1 as shown in Figure 3. This arm is also linearly variable with numbered dials which are manually preset to any cable length from 0-9999 feet. The resultant balance point of the standard R_3 will then equal the unknown resistance in ohms/mile of copper conductor at 68°F.

* * *

To balance out the ohms/mile effect of the resistance of the internal wiring and test leads in series with the unknown, a compensator R_4 is mechanically geared to R_1 and preset to a value of resistance equal to (100,000/length of the cable (L))ohms.

Using the notations in Figure 3 at balance:

$$R_1\ (1+\alpha\ [t—68]\ )\ (R_3+R_4) = R_2\ (R_x+R_5+R_6)\ (1+\alpha\ [t—68]\ )$$

in which: α **equals the temperate coefficient of resistance.**

t equals ambient temperature in °F.

Substituting the values indicated and cancelling:

$(1+\alpha\ [t—68]\ )$ from both sides of the equation

$$L/10\ (R_3+100{,}000/L) = 528.0\ (R_x+18{,}939)$$

$$R_3\ L/10+10{,}000 = 528.0\ R_x+10{,}000$$

$$\therefore\ R_3 = \frac{5280.0}{L}\ R_x \text{ Ohms/mile}$$

(*Please turn to page* 1042)

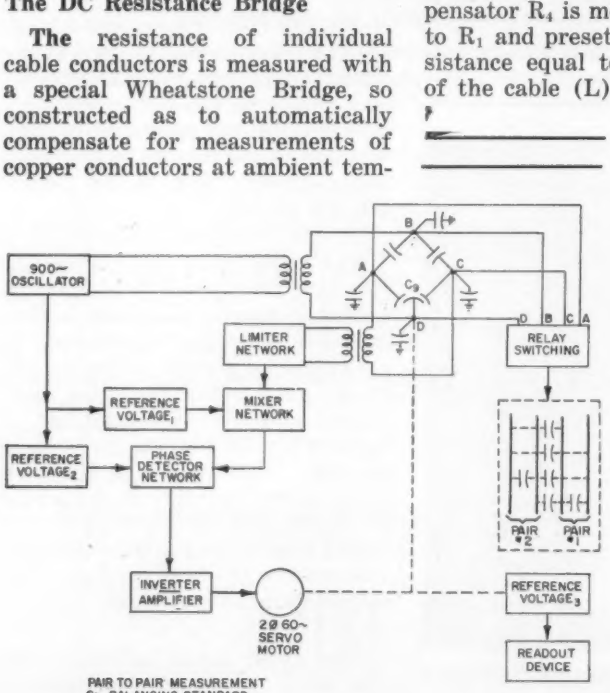

Fig. 4 - 900~ Capacitance Unbalance Bridge

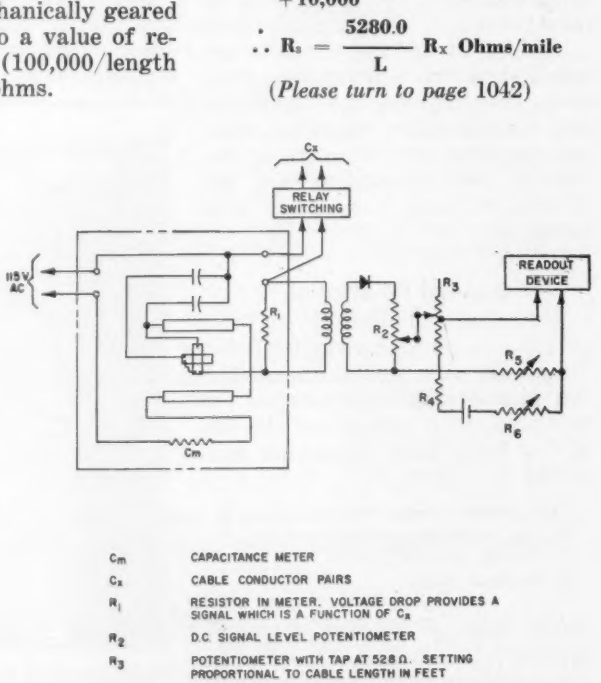

FIG. 5 - SCHEMATIC OF M C BY METER CIRCUIT

Progress Report on Molybdenum Disulfide as a Ferrous Wire Drawing Lubricant

by Peter M. Magie, Vice President
Bemol, Inc.
Boston, Massachusetts

The experience of a number of wire mills with Moly fortified drawing lubricants is reported in the case histories cited in this article.

In recent months 25 wire mills have been conducting extensive tests with molybdenum disulfide ("moly") as an additive to ferrous wire drawing lubricants. This experimentation has led to new production efficiencies, product improvement, and simplified production methods. On the basis of results obtained at these mills, nearly 100 other mills have started tests with molybdenum disulfide in their drawing operations.

Properties of Moly

Moly is an extremely low frictional lubricant, very similar to graphite in its layered structure and gray color. Unlike graphite, however, moly is characterized by coefficients of friction that are roughly half those of graphite; in fact, the coefficients of friction of moly are the lowest of any known material. Also unlike graphite, which loses its lubricity as drawing speeds increase, moly shows decreasing coefficients of friction as the speed of drawing increases. As die pressures increase beyond 100,000 psi, moly exhibits even lower friction; whereas, the frictional values of graphite increase as die pressures increase.

* * *

Moly possesses a high degree of thermal stability and is stable in air to 750°F. Although gradual oxidation occurs above 750°F., moly is being successfully used in hot drawing to 1500°F. On the other hand, graphite is only effective at these high drawing temperatures when its adsorbed moisture is retained. At temperatures normally encountered in dies graphite shows increasing abrasivity as heat drives off its adsorbed moisture. This tendency of graphite to become abrasive has been noted at ambient temperatures below 200°F.

* * *

Another feature of moly is that it has much greater adhesion to metal surfaces than has graphite. In distinction to sulfurized, chlorinated, and fatty acid wire drawing lubricants, both moly and graphite are chemically inert. Moly, although it is a sulfide of molybdenum, does not unite chemically with metal. Its adhesion to metal is explained by its natural affinity for surfaces.

* * *

Moly is insoluble in oil, water, alkalies, and all acids except hot nitric and sulphuric acids. However, colloidal dispersions in oil and water are available which can readily be added to drawing oils and water-soluble compounds. With wet drawing lubricants, given sufficient agitation, 'Pure Moly Powder' can be blended into the wet lubricant, and because of its small particle size (0.75 microns), with normal circulatory agitation, the particles remain temporarily suspended.

The Effect and Removal of Residual Moly Traces

If drawn wire subsequently is to be coated, experience has shown that moly should be used in concentrations below 10 per cent by weight in the drawing compound because of the possibility of excessive traces interfering with adhesion of the coating. Six mills which both draw and coat wire have found that, at concentrations below 10 per cent, moly has had no effect on adhesion of coatings. At concentrations above 20 per cent, two of these mills found that moly interfered with proper adhesion. Similarly several mills have found that the residual traces left on the wire have not interfered with butt-welding, conductivity, etc.

* * *

Although moly, when used in low concentrations, cannot be seen on the wire or even detected by X-ray diffraction, minute traces are nevertheless present. These traces have been quantitatively measured to be between 0.000006 and 0.000000015 inches in thickness. The amount of moly on the wire probably left in the pores of the metal, varies with the amount of reduction, number of passes, amount of moly in the lubricant, etc.

* * *

In several cases removal of the almost insoluble, tenacious traces has been necessary. If removal is necessary, there are several methods of removing the traces. Common practice has been to pickle in sulphuric or nitric acids, or by application of extreme heat in an oxidizing atmosphere in annealing or patenting furnaces. Other methods have been ultrasonic vibration cleaning, or dips in commercially available cleaners.

Case Reports on Drawing Stainless Steel With Moly

Case #1: A New England mill, which specializes in drawing fine diameter stainless and inconel

down to 0.001 inches, has found that moly has increased both carbide and diamond die life by more than 200 per cent. The mill starts its operation by diluting the '#110 Suspension' (35 per cent colloidal moly in water) with 30 parts of a standard lime pretreatment solution. After dipping and air-drying the wire this mill then draws dry through a blend consisting of four per cent 'Pure Moly Powder' and 96 per cent calcium stearate. After the wire is reduced to 0.020 inches, it is then drawn wet through a solution composed of one part of the '#110 Suspension' and 200 parts of a prepared sodium stearate and water solution. This mill reports that not only has die life been more than doubled, but also that power consumption is lower, that drawing speeds have been increased to 4,000 ft/min, and that the drawn wire is much brighter.

* * *

Case #2: Another mill reports similar results in drawing the 300 and 400 stainless series. This company dilutes the '#90 Suspension' (65 per cent colloidal moly in oil) with 180 parts of its regular wire drawing oil. By adopting moly, the firm reports that over-all lubricant costs are now one-third of what they were originally. Also reported is that die life has increased considerably. The traces of moly left on the wire are not objectionable so that removal is not necessary.

* * *

Case #3: A Midwestern mill, a volume producer of #430 stainless, reports that 'Tech Moly Powder' has greatly improved the drawability of stainless and has produced a better surface finish on the wire. This company blends the powder in concentrations of three per cent to 10 per cent with a metallic stearate soap. The company also reports that moly has excellent high temperature resistance and very low drag qualities.

* * *

Case #4: In cold drawing #302 stainless an Eastern mill reports excellent results when adding 'Pure Moly Powder' to 17 parts of a dry calcium stearate soap compound. The stainless rods are pre-treated with lime and then drawn through a six-pass Vaughn machine. The company found that only the first draw box had to be filled with the moly soap blend because of moly's high adhesion to stainless. When compared against graphite and soap compounds, the moly soap reduced die wear and produced a brighter finish on the wire. Although moly is not visible on the wire, residual traces are removed by pickling in a hot solution of nitric acid and hydrochloric acid.

* * *

Case #5: A stainless tube drawing company reports that 'Tech Moly Powder' (maximum particle size, 64 microns), when burnished onto dies and mandrels, has increased die life 10 times. Prior to the use of moly, only eight to 10 feet of tubing could be drawn before serious die damage occurred. With moly this mill averages nearly 100 feet before die damage appears.

* * *

Case #6: Confirming this report, a large industrial research firm regularly uses 'Moli-Paste A' in drawing stainless tubing. The plant superintendent claims that this colloidal paste (40 per cent moly in oil) has permitted better finishes and lower die wear rates.

Case Reports on Drawing High Carbon Steel

Case #7: A New England wire rope mill has discovered in drawing 0.70 per cent carbon wire through an excess of moly that enough moly is left on the wire to provide excellent lubrication of the wire rope when in service. Fatigue tests run by this company revealed that moly lubricated rope lasts 35 to 40 per cent longer than a conventional soap-drawn wire. Production tests showed that, when 'Pure Moly Powder' was blended with 12 parts of a calcium stearate soap compound, moly's low friction decreased plant electrical consumption by 15 per cent. When the '#110 Suspension' was added to 100 parts of a soluble sodium stearate solution, die life increases were as high as 1,000 per cent. This company also found that moly greatly reduced drag on the pulling motors in the wet operation.

* * *

Case #8: In cold drawing high carbon wire through a 20 per cent concentration of 'Tech Moly Powder' in a calcium stearate soap, an Eastern mill has increased drawing speeds 1,000 ft/hr while still reporting higher die life. Prior to being drawn through the moly soap mixture, the high carbon wire is pretreated with lime to increase adhesion. After drawing, the wire takes on a satin-like gloss. Residual traces of moly are left on the wire because the firm feels that moly is beneficial to further cold working of the wire, such as cold heading.

* * *

Case #9: Confirming these findings in drawing high carbon wire, another Eastern mill reports that, by using 'Tech Moly Powder' in the first draw box of a five-hole Vaughn machine, overall lubricant consumption has decreased by more than 50 per cent, while power consumption has decreased seven per cent. This mill also reports that moly produces a very bright finish on the drawn wire.

* * *

Case #10: One high carbon mill reports that the '#140 Moli-Oil Suspension,' when diluted with 20 parts of a light drawing oil has nearly doubled die life while total lubricant costs have dropped. The residual traces of moly on the wire are not objectionable so that removal is not necessary.

* * *

Case #11: Another high carbon mill similarly reports excellent results when using the '#90 Suspension.' In the mill the colloidal suspension is diluted with 60 parts of an extreme pressure drawing oil. The company reports increased die life and better surface finish.

* * *

Case #12: A large New England mill initially tried a 15 per cent concentration of 'Pure Moly Powder' in grease and obtained good results, but the results were not good enough to warrant the higher cost of the moly grease. Testing

indicated that the grease would have to contain free lime in order to increase the adhesion of moly to the wire. In the dry drawing operation extensive tests are being run to determine the effectiveness of a blend, consisting of 'Pure Moly Powder' and 20 parts of a calcium stearate compound. Initial results have looked very promising.

* * *

Case #13: Very recently another New England mill has discovered a unique method of eliminating the pretreatment steps of pickling and lime coating. Prior to moly, research testing showed that die life dropped seriously when conventional pretreating was not done. By blending 'Moli-Paste A' with 20 parts of a wire drawing grease, this company found that die life was excellent without pretreating.

* * *

Case #14: In dry drawing 0.65 per cent high carbon wire one mill has found 'Tech Moly Powder' to be extremely effective. Prior to moly, a dry olive soap powder was placed in each of the five draw boxes on the machine. Upon adopting moly the company has found that only the first draw box has to be filled. Even though the firm uses much less lubricant, moly's low frictional values have reduced motor drag by 10 per cent. Higher die life is also reported.

* * *

Case #15: Another high carbon mill reports that, when drawing 0.60 per cent carbon wire, moly is beneficial. In dry drawing, 'Tech Moly Powder' is blended with 20 parts of a calcium stearate soap. In wet drawing the '#110 Suspension' is diluted with 40 parts of a sodium stearate solution. Reported advantages in both the wet and dry operations are increased die life and better surface finish.

* * *

Case #16: In drawing high carbon and liquor coated wire to fine diameters one Eastern mill has been extremely successful with moly. All wire drawn at this mill is pickled and then moly-lime pretreated. To the prepared lime bath this company adds one pound of the '#110 Suspension' to every 50 pounds of the lime solution. In the dry drawing operation five per cent 'Pure Moly Powder' is added to a conventional calcium stearate compound. Die life increases in the dry operation have averaged about 200 per cent.

* * *

In the wet drawing operation this mill ran extensive tests to determine the amount of moly necessary to obtain the desired results. By adding the '#110 Suspension' ounce by ounce and plotting quantity against amperage readings, the company found optimal results were obtained at a dilution of one part of the water suspension with 1,000 parts of the soluble sodium stearate compound. At this point amperage readings were 15 per cent lower and die life increases were nearly 400 per cent. A chief advantage, which governed the adoption of moly at this mill, is the bright, scratch-free wire that has been obtained.

* * *

Case #17: Another producer of liquor coated wire has tried both 'Pure Moly Powder' and the '#110 Suspension' in drawing this special wire. Testing at this mill showed little or no increase in die life or surface finish when working with the liquor coated stock. In this case it is believed that moly reduced die temperature so much that the soap compounds, blended with the moly, could not fully react with the surface of the wire. Further tests are now being conducted at this mill using lower titer point soaps.

* * *

Case #18: In dry drawing hexagonal steel wire with 'Tech Moly Powder' an Eastern mill reports higher die life, better surface finishes, and lower power consumption. The wire is pretreated with borax and then run through a draw box containing the powder. Prior to moly, the firm had been using a metallic stearate soap and was experiencing low die life.

Case Reports on Drawing Low Carbon Steel

Case #19: A large Midwestern low carbon mill has discovered that 'Tech Moly Powder' has increased average die life 275 per cent following mechanical descaling of rods. The rod now passes through a series of roller-type scale breakers, through a soluble soap bath, and directly into the ripper die draw box. The ripper die draw box contains eight per cent Tech Moly Powder in a calcium stearate soap compound. At this eight per cent concentration, the mill obtains excellent surface finishes and die life increases of 275 per cent. When only two per cent 'Tech Moly Powder' is added to the ripper draw box, the wire remains dull, although die life is nearly 200 per cent greater.

* * *

Case #20: Confirming this report, another Midwestern low carbon mill reports identical success in eliminating the acid pickling and lime coating pretreatment steps. In this operation the company is blending 'Tech Moly Powder' with 15 parts of a calcium stearate soap compound.

* * *

Case #21: One New England mill which specializes in cold heading wire has found that moly is beneficial as it eliminates die scratching in the heading operation. This company blends 'Tech Moly Powder' with an equal weight of a metallic stearate soap. The moly-soap mixture is used only in the closing draw box of a multiple-hole drawing machine.

* * *

Case #22: A large Eastern manufacturer of cold heading wire has obtained almost identical results when drawing through undiluted 'Tech Moly Powder' in the closing die box of a multiple-pass machine. In this case, customers for the nail wire specify that the wire be drawn through moly, as the thin film left on the wire prevents the scratching of cold heading dies. A new technique being experimented with at this mill is dipping the drawn and cleaned wire in the '110 Suspension.' Hoped for results are even better performance in the cold heading operation. In this case

(*Please turn to page* 1054)

Read how the *Taylor·Tot* people realized important SAVINGS with switch to DSC-PORTSMOUTH LPR COILS

2000 pound LPR's have reduced downtime frequency by about 86%; slashed scrap loss proportionately; upped production 12 to 15%; eased the fabricating job.

Here are direct quotations from a May 27, 1960 letter written by W. N. Muchmore, Vice President of The Frank F. Taylor Company

TESTING—"Several months back your Cincinnati office suggested your long production run coils. Frankly, we were skeptical of the advantages claimed. About six weeks ago, however, we ordered a truckload in 2000 pound coils so we could, from actual experience in our factory, determine if they would be more economical than the 300 pound coils we used for years."

RESULTS

UNLOADING TIME CUT 82%—"Your initial shipment was unloaded with our fork-lift truck by 1 man in 1¼ hours. Like shipments of 300 pound coils always took 2 men 3½ hours each with the same equipment. Reporting the time saved, our receiving clerk questioned, '*Why didn't we do this a long time ago?*' "

STORAGE SPACE HALVED—"The 2000 pound coils stock more compactly than the 300 pound coils, saving us about 50% in floor area for the same weight of wire."

PRODUCTIVITY UP 12 TO 15%—"With the big coils, our two S&C machines straighten and cut 12 to 15% more wire than previously with the small coils and in the same length of time, due to reduced downtime for coil changes."

LESS DOWNTIME, LESS SCRAP, MORE TIME—"With fewer coil changes, we get less coil-end scrap losses and our S&C operator now has time for other work in his department. His reaction, 'It makes my job easier.' "

CUSTOMER SATISFACTION—"The savings realized have more than justified our switching to 2000 pound LPR's. *We can recommend them to any manufacturer still using small coils.*"

Care for more facts about best-in-the-long-run LPR's or other DSC products? Get quick action from your nearest DSC Customer "Rep" or write: Detroit Steel Corporation, Box 7508, Detroit 9, Michigan.

Notice the accessible, compact way high-density LPR's stack in contrast to the sprawling heap of 300 pound bundles at right.

PHOTOS COURTESY THE FRANK F. TAYLOR COMPANY, NORWOOD, CINCINNATI, OHIO

The T-95 *Taylor·Tot* Folding Sleeper-Walker-Stroller using DSC-PORTSMOUTH LPR BRITE WIRE COILS for axles, bumpers, supports, utility baskets, canopy frames, etc.

*A DSC TRADE-MARK

Customer "REP" Offices in Principal Cities

Performance Proved DSC®

DETROIT STEEL

Flat Rolled and Wire Products

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In this department will be published helpful hints on how to do things and the questions asked by our readers on wire processing problems, together with the answers and comments thereon received from the field. In no instance will the identity of the persons asking for advice or of those supplying it be published.

Our readers are invited to send helpful contributions and to submit questions on their technical problems to the Editor. These will be answered from information on hand or from the field, when it becomes necessary to secure counsel from that source.

Wire Forms

QUESTION

Just what does the term "wire-forms" embrace. It appears to be a broad term and I would like to know what products are included in this category.

ANSWER

"Wire Forms" is a term covering an exceptionally broad group of products made from round or flat (ribbon) wire in automatic wire forming machines.

* * *

Such forms may be made for the retail trade or as components of mechanical devices. There are many types of wire forms like springs and pins, that, while being products formed from wire in special purpose machines, are usually classed separately.

* * *

Wire forms made on a large production scale are most often produced by manufacturing specialists on what are called four-slide machines, although some of these machines may have five and even as many as eight slides operating in more than one plane.

* * *

The versatility of the four-slide machine stems from the fact that while a few standard forming dies or tools will form a multiplicity of shapes, special dies can be supplied that will produce practically any shape wanted.

* * *

Single purpose forming machines may be purchased at some saving in capital investment, but today's requirements usually call for machines that can be adapted to a variety of forming jobs by changing the tooling.

* * *

The four slide machine looks complicated and in operation it is hard to follow the rapid succession of forming steps, although one manufacturer of this equipment explained that it is all really very simple: in designing a machine one forming step is planned and each following step is added, so that in the final machine a series of simple single steps are merely coordinated. Sounds easy, but it requires something of a mechanical genius to effect this coordination.

Corkscrew Design

QUESTION

In the making of corkscrews has there been found that the design of the screw has any bearing on its effectiveness.

ANSWER

Many types are made, not all equally effective. A few years ago 23 corkscrew worms, differing in design, dimension or material, were subjected to tests in which readings were taken of the force required to pull them out of corks that had been cemented in place in bottles.

* * *

It was found that spiral wire and steel-web corkscrews with hollow centers were consistently superior to auger types with solid shanks. The latter appeared to weaken the cork center and pulled out relatively easily. Sharp edged screw types also tore the cork and had little holding power.

* * *

Those that gave the best results had a coil diameter of .35 to .40 inches, were very uniform as to the spacing between coils, and had coils spaced apart about .40 inches, measured along the axis. Corkscrews, it was also determined, were best when long enough to go through the bottom of the cork, to enable the pull to be exerted through the cork's height.

* * *

The use of leverage devices to pull corks easily is a matter quite apart from the screw design.

Something New In Coat Hangers

Coat hangers used to be just coat hangers but no longer is this so.

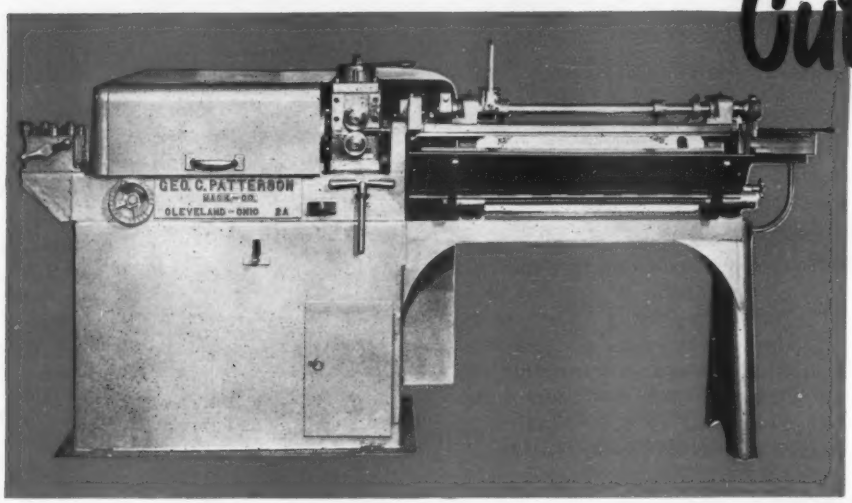
* * *

A concern in Willow Run, Michigan, **The Monarch Governor Company**, has developed a new garment hanger that embodies two new features: provision for adjusting its size and a stainless steel receptacle to hold a moth repellant. The latter is located below the hook into which the anti-moth crystals may be placed — or if one prefers, a sachet for m'lady's garments.

NOW! The Wire Machinery MAN Introduces

AN IMPORTANT NEW DEVELOPMENT

The GEO. C. PATTERSON 2-A Cut-O-Matic



AUTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE

•

Especially Designed For Short Cuts

185 - Cuts Per Minute - Constant

This is the equipment you needed before.

With G. C. Patterson your production will soar.

The speed and price you must compare

For then we know you'll buy with care.

Absolute minimum roller friction obtainable on short cut runs . . . You can now complete your short cut jobs without sacrificing speed or quality . . . To reduce your operating costs you should include or add the Model 2A to your production line . . . Send us your wire requirements from .015 to over 1" for literature and quotation . . . Over 42 models available.

Wire Machinery Inc. has pioneered in new equipment to better the handling of wire. Phone, write or wire — Ask, check, or consult with Wire Machinery for the solution of your production problems.

Wire Machinery Inc.

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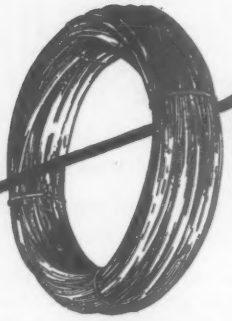
Wire Kinks



More than 500,000,000 steel wire coat hangers are produced annually, that are valued at nearly $2 billion. Automatic machines will convert steel wire into hangers and enamel them at the rate of 1200 per hour.

Rusting

QUESTION

I would like to learn something of the theory of rusting and if you can advise me briefly on this question, your kindness will be appreciated.

ANSWER

Rusting may result from any one or a combination of five factors:

Impurities in the metal
Contact with other "noble" metals
Moisture
Carbon dioxide
Oxygen

* * *

The corrosion of steel generally takes place either from direct chemical action or from electrochemical attack. Since chemical action is accompanied by a displacement of ions, it might be quite correct to consider it actually a form of electrochemical attack.

* * *

Electrochemical action is divided into galvanic corrosion, in which current is generated from the action of gasses and liquids upon two different metals, and another form of electrochemical corrosion, the concentration cell, in which a current is induced by different concentrations within a liquid acting upon a single metal.

* * *

It is usually to overcome some of the difficulties of the corrosion or rusting of steel that various protective coatings are applied to the metal. Aluminum, zinc, nickel, chromium, cadmium and other corrosion resistant metals and metal alloys are applied by various processes to a base metal to provide more or less permanent protection. For temporary protection, as for shipping or storage, a variety of oils or corrosion retarding papers (VP1) are finding growing favor.

Wire in the Automotive Industry

A lot of wire is used in automobile manufacture.

* * *

These will include wire products of considerable variety, such as upholstery springs, border and brace wire, hog rings, valve springs, clutch dampener springs, door lock springs, flexible shafts and casings, brake strand, push-pull controls and casings, windshield wiper parts, front seat adjusters, stitching wire, special shaped wire for valve stem keys, bolts, nuts, rivets, washers, door hinge pins, nails, tacks, screws, staples, spark plug electrodes, tire bead and casing wire, and electric wire.

* * *

This last item includes battery, starter and generator wires, magnet wire for electric motors and the generator, high tension ignition cable, chassis and body wiring, etc.

* * *

There are, of course, other types as for ornamental attachments, like wire wheel hub corers. The wire used may be low and high carbon steel, stainless steel, galvanized or tinned wire, bare and insulated copper, etc.

* * *

That the automotive industry may be visualized from the following estimates, based on an annual production of 5.5 million cars of average weight of 3265 pounds, wire products weighing 32,450,000 pounds and electric wire weighing 11,000,000 pounds would be needed. Should the production estimates for 1960 of 7 million units be attained, the volume for wire products will reach 41,300,000 pounds.

* * *

Not a bad market to aim at market-wise!

Wire Die Lore

The history of the wire die is shrouded in mystery, as very little actually is known about their origin. The first written reference to the die is in the **Theophilus** manuscript, which was written about the year 1000 A.D.

* * *

Dies are mentioned casually as tools to be found in any properly equipped metal worker's shop. Reference to them would lead one to believe that wire drawing was fairly new, growing out of the practice of pulling soft metal wires through tapered holes in hard oak blocks to smooth out hammer marks, since early wire was made by shearing off strips of metal from sheets, and hammering them round.

* * *

It is surmised that in some of the smoothing out operations it was noticed that a little over-hammering would elongate the wire, which led to the use of dies for drawing.

* * *

However, among the Viking relics of circa 700 A.D. there are two iron dies and one has been found in France that is dated about 400 A.D. These implements look like

(*Please turn to page* 1056)

Wire Nails

by

E. George Stern

Research Professor, Wood Construction

Virginia Polytechnic Institute

Blacksburg, Virginia

That even the lowly nail is subject to research and development is revealed in this paper. Many readers also will recall the paper by Allan B. Dove, in which was outlined the research that preceded the development of the "Ardox" nail.

While known for 130 years and used in this country for about 120 years, wire nails have been spending the past decade on the college campus. Thousands of wire nails have been enrolled in an especially equipped research laboratory at Virginia Polytechnic Institute to take graduate courses and exams, to pass or flunk. They have come from all over the world, Sweden and Switzerland, England and Japan, Canada and a number of U. S. manufacturing plants. However, most of them have come from the largest manufacturer of threaded and special nails, the **Independent Nail & Packing Company** of Bridgewater, Massachusetts.

* * *

During August, 1940, this Company submitted samples of threaded nails to the writer with the suggestion that they be given consideration for construction purposes. At that time, no one had envisioned what could be accomplished by the proper use of these improved nails, especially in the field of building construction; how good they actually are: what design loads can be transmitted by them, how many common wire nails can be replaced by a single threaded nail. The handful of samples were supplemented by thousands of additional nails a few years later when the above forward-looking company had signed a research contract with Virginia Polytechnic Institute to investigate the potential of threaded nails.

* * *

As a result, improved nails and nailing procedures were introduced and new construction procedures developed. Five years ago, some of these procedures were demonstrated in "The House that Nails Built," the VPI Demonstration House, erected in Blacksburg, Virginia, under the sponsorship of Independent Nail, in cooperation with the National Association of Home Builders. A second demonstration house is being planned at this time to show to the public some of the results of research on improved nails and nailing which has been performed during the past five years.

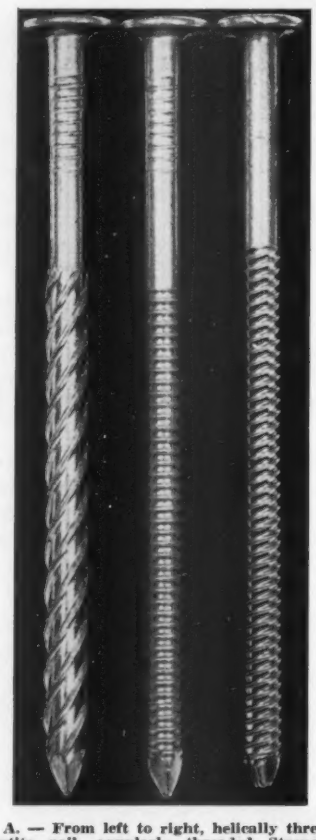


Fig. A. — From left to right, helically threaded Screwtite nail, annularly threaded Stronghold nail, and helically threaded Stronghold Screwnail with small lead angle. * * * * *

These improved nails are plain-shank nails provided with fish-hook-like, helical or annular threads (Fig. A) through a thread-rolling operation. They may be made of low-carbon or high-carbon steel or non-ferrous metals. The high-carbon-steel nails may be heat-treated and tempered to be marketed as hardened nails. Being hardened, they may be slender and still provide extraordinary resistance to bending. On the other hand, they may have an extra large diameter to transmit heavy shear loads with a minimum of deformation. Structures assembled with such nails can be as rigid as certain glued structures, with the joints stronger than the wooden members thus fastened.

* * *

The cost of a pound of these improved nails may be 1½" to 2½" times that of same-length common wire nails. However, properly threaded nails can provide as much as ten times the holding power under certain conditions. Because of their greater effectiveness, these improved nails can be smaller in size, resulting in more nails per pound; fewer nails may be used in a joint; low-grade lumber may be up-graded because of the increased strength and rigidity of the joint; more effective jointing procedures can be used; and new construction methods have resulted.

* * *

Any such cost comparison may also be looked at from another angle: The cost of all nails required to build a house may amount to less than two-thirds of one percent of the total cost of the house. Thus, the increase in cost resulting from a certain use of

Fig. B. — The 33 nails used during erection of VPI Demonstration House during 1955 * * * * * * * * * * * * *

threaded nails (Fig. B) is almost negligible from the overall cost viewpoint, and especially in light of the many advantages provided by their use.

* * *

During their 130-year history, the wire nail has grown up and matured into a fastener of eminence, from a minor U.S. production item of 600,000 kegs in 1886 to one of more than 17½ million kegs in 1950, when heavy foreign imports started to reduce U.S. production to a mere 8½ million kegs in 1958. During that period, it outgrew its predecessor, the cut nail (Fig. C), whose production of more than 8 million kegs in 1886 dwindled to 608,000 kegs in 1950 and 260,000 kegs in 1958. Of the 17½ million kegs of wire nails, less than five percent are provided with threaded shanks. However, these 1250 railroad cars of threaded nails perform jobs which could not be accomplished with the plain-shank, cement-coated, etched, barbed, knurled, twisted or fluted nails.

* * *

The mature threaded nail had a long way to go to reach its present

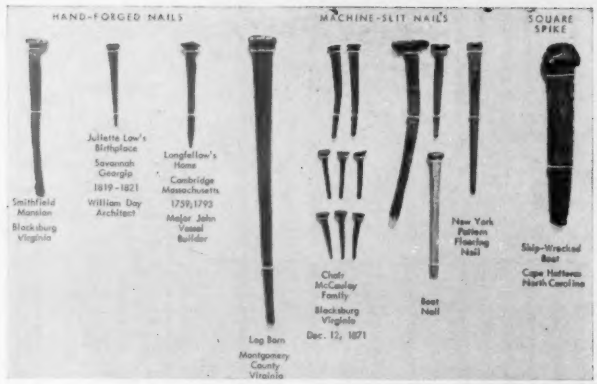

HAND-FORGED NAILS
MACHINE-SLIT NAILS
SQUARE SPIKE
Smithfield Mansion Blacksburg Virginia
Juliette Low's Birthplace Savannah Georgia 1819-1821 William Day Architect
Longfellow's Home Cambridge Massachusetts 1759;1793 Major John Vassal Builder
Log Barn Montgomery County Virginia
Chair McCauley Family Blacksburg Virginia Dec. 12, 1871
Boat Nail
New York Pattern Flooring Nail
Ship-Wrecked Boat Cape Hatteras North Carolina

Fig. C. — Cut nails of the past. * * * * * * * * * * * *

BARBED NAILS
Superficially Barbed Aluminum Nails
Slightly Barbed Steel Nail
"Barbed" Drywall Nail England
Diagonally Barbed Square Bronze Nail
Deeply Barbed Cement-Coated Steel Nail
Annularly Barbed Galvanized Steel Nail

Fig. D. — From left to right, superficially barbed aluminum and steel wire nails, diagonally barbed square bronze wire nail, deeply barbed cement-coated steel wire nail, and annularly barbed galvanized steel wire nail. *

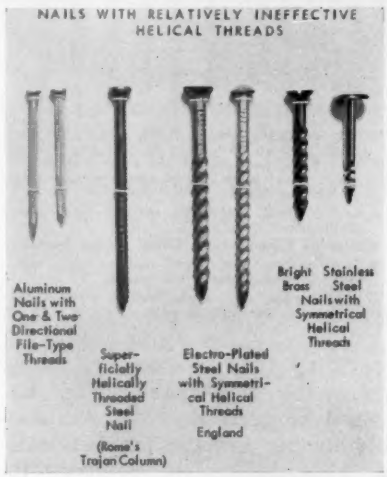

NAILS WITH RELATIVELY INEFFECTIVE HELICAL THREADS
Aluminum Nails with One & Two-Directional File-Type Threads
Superficially Helically Threaded Steel Nail (Rome's Trajan Column)
Electro-Plated Steel Nails with Symmetrical Helical Threads England
Bright Brass
Stainless Steel Nails with Symmetrical Helical Thread

Fig. F. — Wire nails with relatively ineffective threaded shanks. * * * * * * * * *

stature. Barbing (Fig. D) was one of the early devices to increase the nail-shank surface by deforming it and, thus, the contact area with the surrounding wood. Superficial barbing, diagonal barbing, and annular barbing are processes still practiced today in a limited way. The increase in holding power offered by such nails is superficial in many cases, and usually of a temporary nature. Like cut nails, barbed nails are still available for purchase over the counter.

* * *

Squaring the round wire and

FLUTED WIRE NAILS
HELICALLY TWISTED WIRE NAILS
Longitudinally Fluted Wire Nail Sweden
Helically Fluted Wire Nail Canada
Early Twisted Square Wire Nails U.S.A.
Hardened Nail with "Butterfly" Point Japan
Pallet Nail Switzerland
(Note: Right Twist)
Cement-Coated Twisted Square Wire Nails U.S.A.

Fig. E. — From left to right, longitudinally and helically fluted steel wire nails and typical twisted square wire nails. * * * * *

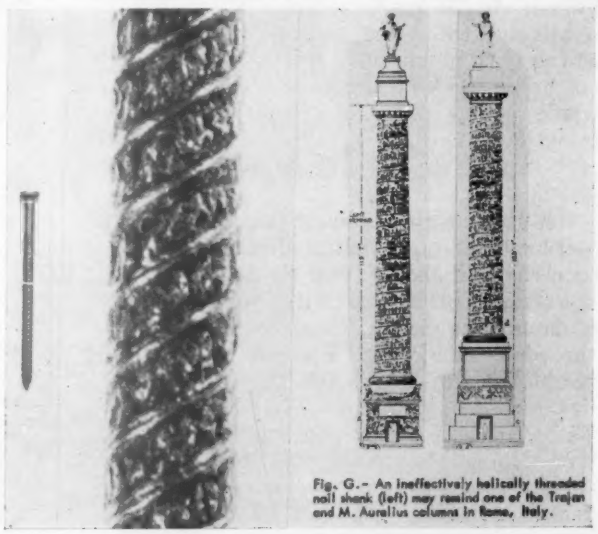


Fig. G.- An ineffectively helically threaded nail shank (left) may remind one of the Trajan and M. Aurelius columns in Rome, Italy.

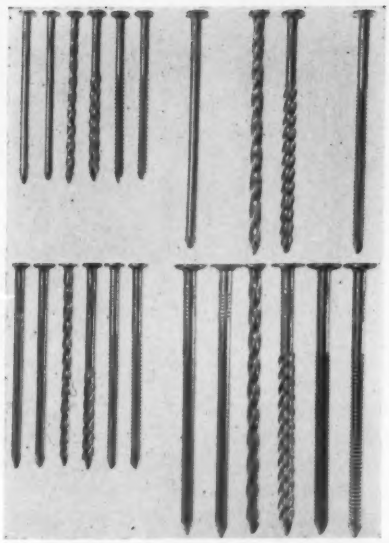


Fig. H. — Bright Steel 2½" (8 d) x 10 ga., 3" (10 d) x 9 ga., 3½" (16 d) x 7 ga., and 4" (20 d) x 6 ga. nails tested for their withdrawal resistance and lateral load-carrying capacity. From left to right:

1. Low carbon and high carbon steel plain shanknails;
2. Medium carbon steel fluted Ardox nails;
3. Low carbon and high carbon steel helically threaded Screwtite nails;
4. Low carbon and high carbon steel annularly threaded Stronghold nails. * * * *

providing four longitudinal flutes along the nail shank (Fig. E) helped to increase both stiffness and holding power, a practice used in the Scandinavian countries to produce a long and slender nail which does not require use of special steel or hardening procedures. Twisting a square wire nail and fluting a round wire nail (Fig. E) produced early during this century the predecessor of the modern helically threaded nail. Made today in limited quantities by one U. S. manufacturer, the relatively stiff fluted nail as well as the twisted nail have symmetrical helical indentations along the whole shank and incompletely round heads.

* * *

Rolling one-directional or two-directional, file-type, helical threads onto the nail shank (Fig. F) does not result in a nail with optimum holding power. Superficially threaded nails (Fig. F) can be reminders of the Trajan and Aurelius columns in Rome (Fig. G). These nails are relatively ineffective. Similarly, symmetrical helical threads forming rounded indentations along the nail shank

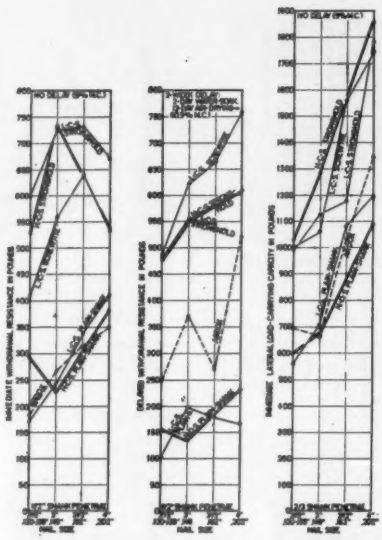


Fig. H.—Immediate and delayed withdrawal resistance and immediate lateral load-carrying capacity of 2½", 3½", and 4" bright plain-shank, fluted and threaded nails driven into dry Southern pine of 0.60 specific gravity and tested at withdrawal and loading rate of 0.100 in./min.

(Fig. F), similar to those found on fluted and twisted wire nails, are only stepping stones in the right direction.

* * *

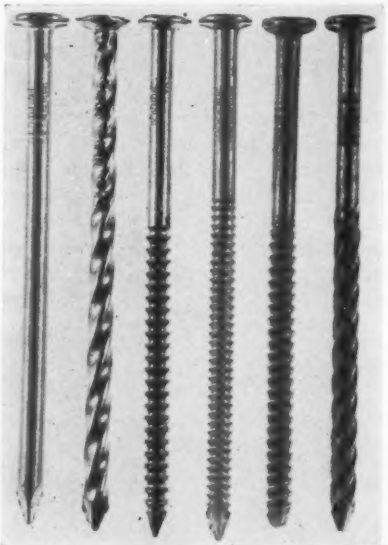


Figure I. — Bright and hardened-steel nails of 2½" length tested for their withdrawal resistance. From left to right:

1. 0.131" bright low carbon steel plain-shank nail;
2. 0.120" bright medium carbon steel fluted Ardox nail;
3. 0.120" bright low carbon steel annularly threaded Stronghold nail;
4. 0.123" bright high carbon steel annularly threaded Stronghold nail;
5. 0.123" cement-coated hardened high carbon steel helically threaded Stronghold Screw-nail;
6. 0.123" cement-coated hardened high carbon steel helically threaded Screwtite nail. *

Threaded nails offering maximum holding power have nonsymmetrical fish-hook-like, one-way threads (Fig. A). These nails are easily driven into the wood and extremely hard to pull out. If incorrectly nailed, it may be difficult to take the assembly apart without damaging it. A simple test consists of holding these nails between two fingers and applying slight pressure with the fingers: It will be found easy to push the properly threaded nail "in" and hard to pull it "out" without chafing the skin.

* * *

The effectiveness of plain-shank versus helically fluted versus helically or annularly threaded nails has been demonstrated by numerous test data (Fig. H). On the basis of such test data (Fig. I), it has been feasible to replace, for instance, the 8d (2½" x 0.129") common wire nail with the 7d (2⅛" x 0.101") annularly threaded sinker for fastening subflooring. This threaded sinker, weighing less than one-half (48%) of the

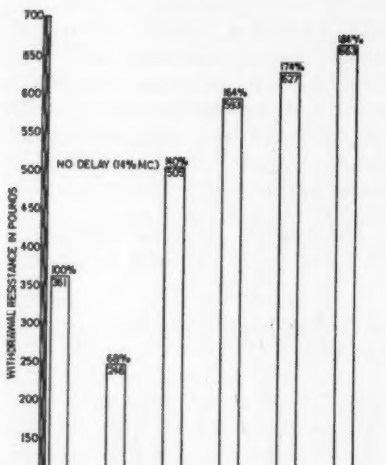


Fig. I. — Immediate withdrawal resistance of 2½" plain-shank, fluted and threaded nails driven, without predrilling, for depth of 1⅝" into dry red oak of 0.61 specific gravity and tested, immediately after being driven, at withdrawal rate of 0.100 in./min. * * * * *

(*Please turn to page* 1032)

Lincoln Electric Announces New Wire Joiner

A resistance butt welder to produce continuous wire feeding has been developed by the **Lincoln Electric Company,** Cleveland, Ohio. The Wire Joiner eliminates time delay from reel changing and wire threading in submerged arc welding as well as in other types of industrial operations using wire fed from a coil.

* * *

Powered by a compact 60 cycle, 220 or 440 volt, single phase transformer, the Wire Joiner splices wire in sizes from 5/64 to 7/32 inch in diameter in one to six seconds. To make joints in wire, the operator places the ends of the wire in tongs and starts the welder which automatically applies current, upsets the joint, and shuts off on completion of the timed welding cycle. Flash cutter pliers, an accessory item, remove excess metal at the joint.

* * *

The Wire Joiner, complete with transformer, tongs and cable weighs 35 pounds, and can service several areas with one unit.

* * *

Further information can be obtained from the Lincoln Electric Company, Cleveland 17, Ohio.

New DC Hipot Tester

The Federal Manufacturing Co., Wallingford, Conn., has announced a newly designed DC High Potential Tester for testing magnet wires for dielectric faults.

* * *

Features of the instrument are.

Dual Milliamp

Federal DC High Potential Tester. * * *

Meters and Voltmeter
0 to 2.5 K V
Electronic Fault Detection
Circuit with Sensitivity Control
Tube Rectification.

* * *

Other models are available to customer specifications. Full detail upon request will be sent.

Portable Unit Detects Sub-Surface Cracks

The United States Casting Repair Corporation has announced development of their Model S-20 Seal-Lock Magnetic Crack Detector.

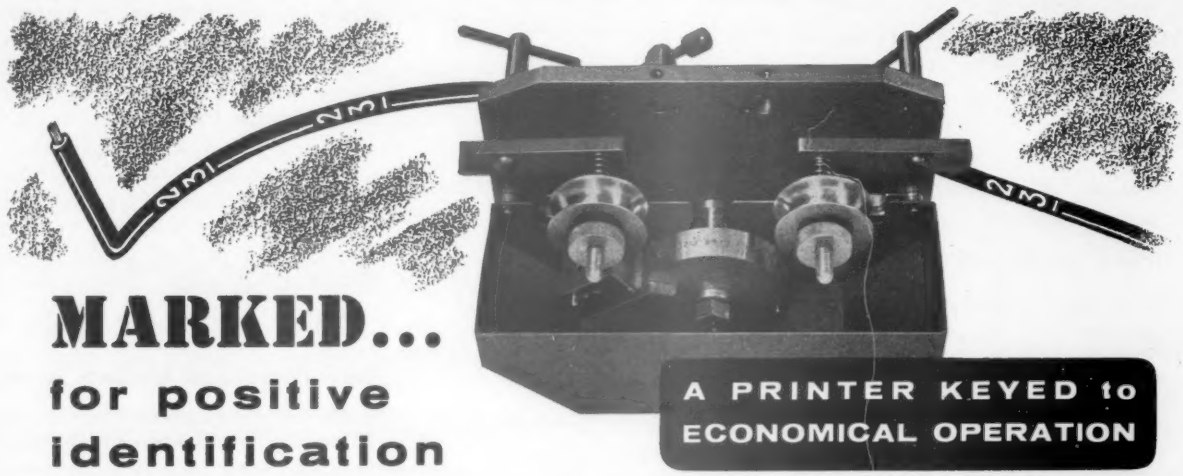
* * *

This revolutionary new unit, patent pending, is capable of detecting sub-surface as well as surface cracks, flaws and defects in any ferro-magnetic metal.

* * *

Although priced competitively with ordinary A.C. yoke units, it develops the same type of powerful, penetrating D.C. magnetic field, found in large, expensive installations.

* * *



MARKED...
for positive identification

A PRINTER KEYED to ECONOMICAL OPERATION

Now . . . the Gillies Single Printer — prints large, clear, legible letters and numbers or IPCEA color code on one side of insulated wire, plastic, neoprene or rubber hose and tubing. A machine easily positioned in a wire line.

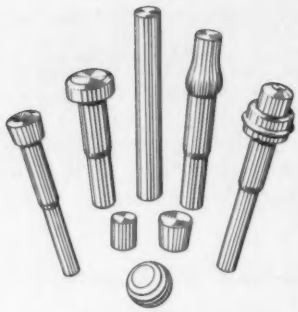
Uses standard flat or the engraved Gillies Concave marking wheels. Concave wheels allow the use of much larger print than flat wheels and make perfect guides for wire. Simplicity of design for rapid cleaning. Wheels of any width may be used on the Gillies Single Printer, Model GS-100. Adjustable guide wheels have vernier control for precision adjustment.

GS-100 for standard wire
GS-100 HD for heavy wire (Heavy Duty)
GS-200 A Prints both sides at once

SEND FOR SAMPLES OF WIRE IMPRINTED WITH GS-100, GS-100 HD OR GS-200 A

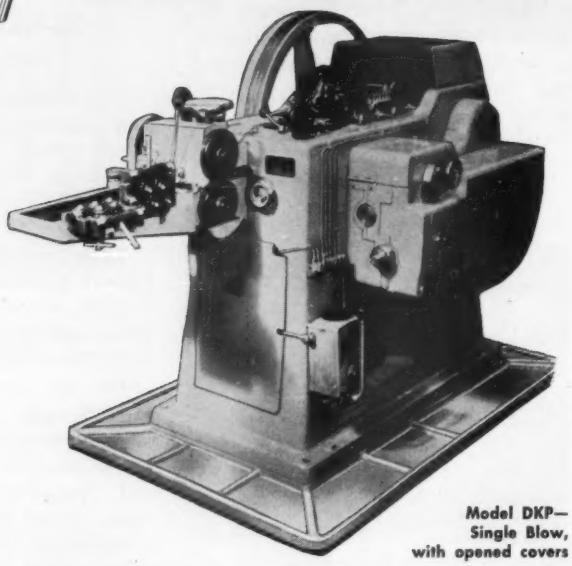
PRICES ON REQUEST

DUNCAN M. GILLIES CO., INC.
P. O. BOX 181 · WEST BOYLSTON, MASS.
TELEPHONE TE 5-4445



Single and Double Blow COLD HEADERS

UP TO **350** PCS. PER MIN.



Model DKP—Single Blow, with opened covers

These famous German machines feature:

- ★ CAPACITIES—3/16" to 1" dia. wire stock: Short Stroke—1" to 4-15/16" shaft length; Long Stroke— 1¾" to 8"
- ★ Fitted with solid or open dies
- ★ QUICKLY ADJUSTABLE PUNCH SHIFTING SLIDE—has double locking mechanism
- ★ WEAR PLATES ARE ADJUSTABLE nitraded steel
- ★ ONE SHOT LUBRICATING SYSTEM—to all parts of machine
- ★ Special types of Cold Headers for the production of balls, cylindrical and taper rollers and cold forged components
- ★ A complete range of auxiliary equipment such as re-heading machines, trimmers, pointers, slotters and thread rollers are available

Write or Phone ED 1-4858 for details!

SOLD AND SERVICED IN U.S. AND CANADA BY

The BOLTMASTER Co.

EXCLUSIVE IMPORTERS OF GERMAN CRAFTSMAN PELTZER & EHLERS MACHINERY—BUILDERS OF MACHINERY FOR THE BOLT INDUSTRY SINCE 1888

21055 LORAIN ROAD CLEVELAND 26, OHIO

In laboratory and field tests, the new Seal-Lock Magnetic Crack Detector has instantly detected defects in steel bars as deep as ½ inch below the surface.

* * *

The unit is completely portable, weighing only 30 pounds; and can be operated from a normal 110 Volt A.C. source or from a truck battery. Units are available for operation on any other A.C. or D.C. voltage. Results are always uniform, since temperature or humidity do not affect it.

* * *

For additional information, write to United States Casting Repair Corp., 6432 Edmund St., Phila. 35, Pa.

Crucible Steel Shows New Film

On March 24th executives of the **Crucible Steel Company of America** entertained over 80 members of the press for a showing of Crucible's new 45 minute color film "Specialty Steels."

* * *

The film was planned by **Michael Stumm,** Director of Information Services, to tell the story of the science and the art which goes into producing the special purpose steels; such as stainless steels and tough wear and shock resistant steels for the tool room.

* * *

The sequence of stainless steel was photographed at Crucible's integrated mill at Midland, Pa., and the making of tool steels at the Sanderson-Halcomb Works, Syracuse, N. Y.

New Patent and Abstract Service

Patent Intelligence File Co., 187 Olive St., New Haven 11, Conn. introduced early in 1960 a day-to-day Service. Company will supply any of the 2,000,000 Patent Abstracts on 7" x 10" 3 hole-punched loose leaf sheets, exactly as published in the U. S. Patent Office Official Gazette. On a Free Service Account basis, Company will watch currently, and search back year art for Patent Intelligence ordered by:- Patent numbers, Inventor and Company names, Classes and Sub-Classes or Types of patents. A small, standard price is made for

each abstract supplied.

* * *

Another division known as **"World Abstract and Idea Exchange"** will serve similarly. Abstracts on some 300 to 400 subjects of world knowledge (Arts, Science, Industry, Government, etc.) will be submitted on 7" x 10" sheets. The Abstracts are screened by a specialist for each subject, so that only new and progressive ideas may be copied for mailing to members registered for a specific subject or subjects. Literature is available covering both services.

Wire Cloth Slitting Service

Belleville Wire Cloth Co. announces that their medium range of mesh from .0035" to .020" wires in plain and twilled weaves are available slit in long strips to any actual using width. Wire cloth now can be slit in short lengths and in extra long lengths from production runs with a precision never before possible.

* * *

This precision is made possible by making cuts along the same wire throughout the entire length of the roll, eliminating the jagged sections and sudden curving in the strip that often results in jammed guides or jigs.

* * *

For complete information, please write to Belleville Wire Cloth Co., Inc., 135 Little St., Belleville, N. J.

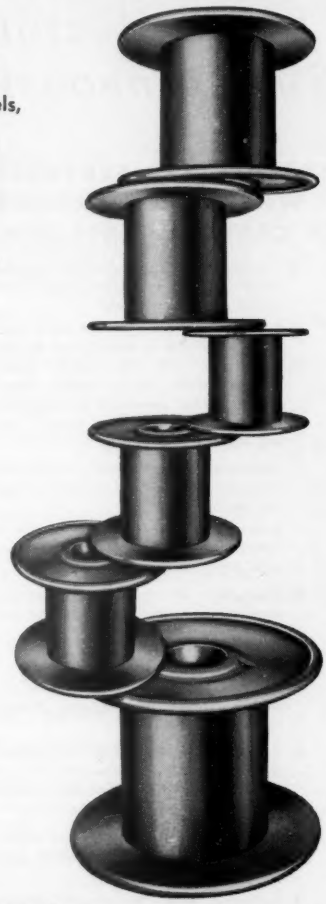
Cobalt Research on Corrosion of Stainless Steels

Cobalt additions to chromium stainless steels have a favorable effect on their resistance to corrosion, say researchers of the Cobalt Information Center.

* * *

The influence of cobalt additions on the structure and the mechanical and chemical properties of ferritic and austenitic stainless steels is being studied at the Centre National de Recherches Metallurgiques, Liege, under the sponsorship of the Centre d'Information du Cobalt. First results of this investigation are now available in a report entitled, "The Corrosion Resistance of Some Stainless Steels Alloyed with Cobalt," published in

APCO Steel Reels
***Engineered* For**
Balance!



Smooth, High-Speed Wire Processing begins with precision-balanced Apco reels, spools and bobbins. Engineered to exact tolerances, Apco steel reels run steady and true on the arbor . . . last longer because they're made stronger . . . won't gouge, warp or burr ever. All-steel reel construction by Apco is extra safe, extra durable for repeated handling . . . assures easy spooling without wire breakage or trapping. It gives you a low-cost production package that pays off in wire savings, minimum machine downtime, and many more on-the-line economies.
Tell us your wire or wire handling problem. You can be sure that Apco has the answer that makes real sense. Prompt delivery, too.
Write, wire or phone collect.

Pacific Coast Representative:
GORDON PROFFITT
World Trade Center
Ferry Building
San Francisco 11, Calif.

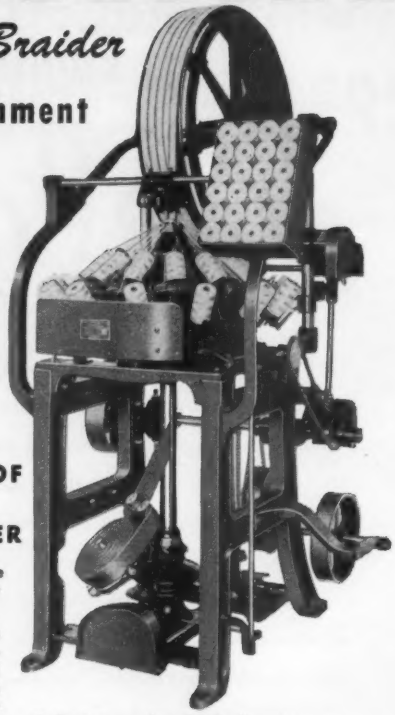
Canadian Representative:
HUGH P. WILLIAMS & CO.
47 Colbourne Street, West
Toronto, Ontario, Canada

APCO MOSSBERG COMPANY
LAMB STREET, ATTLEBORO, MASSACHUSETTS

WARDWELLIAN

24 Carrier Cable Braider

With Taping Attachment



Applies Tape and Braid to Conductor Simultaneously

HAS ALL THE FEATURES OF WARDWELL STANDARD 24 CARRIER CABLE BRAIDER

- Taping head has means for adjusting the tension applied to the tape, thereby assuring a uniform lay.

  A mechanical stop motion which operates upon breakage or exhaustion of the supply, stops both the taping head and braider head at the same time. This eliminates the possibility of braiding over the conductor when the tape is not being applied.

  Change gears for altering the lay of the tape are conveniently located at front of the machine.

  Due to the space required for the taping attachment, this machine can be furnished with high stand only.
- Production 54" to 259" per minute depending upon the texture of the product.
- Standard set of twelve change gears furnished with each machine.
- Machine can be adapted to produce one-and-one braid by changing thread deflectors.
- Carrier speed 75 R.P.M. for cables from ¾" diameter to maximum of 1⅛" diameter or 500,000 circular mils; production 900 picks or plaits per minute.
- Carrier speed 100 R.P.M. for cables ¾" diameter and smaller, 1,200 picks or plaits per minute.
- Equipped with "Maxitorq" clutch; 12" driving pulley, 3" driving belt.
- Speed of braider countershaft 345 R.P.M. for carrier speed of 75 R.P.M. or 460 R.P.M. for carrier speed of 100 R.P.M.
- Ratio of braider countershaft speed to carrier speed 4.6 to 1.
- Capstan 36" diameter, 6" face.
- Beater opening 1¾" diameter.
- Supply yarn packages Universal wound, 2-11/16" diameter, 5" traverse on tubes 5¼" long, ⅜" hole, four point wind.
- Counter for measuring product in feet or yards furnished upon request at additional cost.
- Motor drive furnished upon request at additional cost.
- Power required dependent upon conditions. Estimate furnished upon request.
- Supply and windup stands are not furnished.
- Weight approximately 1850 lbs.
- Weight crated for domestic shipment approximately 2000 lbs.
- Weight boxed for export shipment approximately 2500 lbs. or 1134 kilograms.

TAPING ATTACHMENT DATA:

- Maximum number of turns of taping head 100 R.P.M. — minimum 16 R.P.M.
- Maximum diameter of supply package 12".
- Maximum width of tape 3".
- Minimum width of tape ¾".
- Size of hole in tape package 3".
- Taping head is equipped to run either clockwise or counter-clockwise.

REPRESENTATIVES FOR EUROPE, BRITISH COLONIES AND DEPENDENCIES
JAMES MACKIE & SONS, LTD.
BELFAST, IRELAND

Wardwell
BRAIDING MACHINE CO.
CENTRAL FALLS, RHODE ISLAND, U.S.A.

133-9

the fifth issue of **Cobalt.**

* * *

Stainless steels investigated contained 17 and 27 per cent chromium and had nickel contents of 0, 2, and 9½ per cent. Cobalt additions ranged from 1.5 to 10 per cent. Reprints of this research report are available to interested persons who address requests on company letterhead to the **Cobalt Information Center,** c/o Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio.

Champion Goes to Specialty Rod Production

The Champion Rivet Company, Cleveland, Ohio, has been a leader in the development of welding electrodes for 30 years. It has done intensive research in this. As a result of intensive research, Champion now offers a complete line of welding electrodes for low-alloy high-tensile steel, high-alloy steel, Croloy, stainless steel, nonferrous materials, and tool steel.

* * *

This research, plus an analysis of the welding-electrode business, has convinced Champion that welding stands on the threshold of a new era. Trends detected in missile development, rocketry, nuclear physics, and atomic energy show unprecedented vistas for the electrode manufacturer.

* * *

The manufacture and sale of specialty rods bears little in common to that of the mild-steel rods, although Champion has produced both for many years. The company now forsees such rapid development in the specialty field that in the future it would be difficult to concentrate on both at once. Champion therefore terminated its domestic production of mild-steel rods effective April 1, 1960. It thus ceased to be a supplier to present mild-steel users.

Bulletins on Air Compressors

Selection of single-stage centrifugal compressors up to 4.0 lbs. equivalent air pressure (EAP) for air applications can be quickly made by means of condensed procedures given in two new **Allis-Chalmers** bulletins.

* * *

The one bulletin — 16B9485 — gives sizing procedure for A-C standard B style close-coupled or overhung type centrifugal compressors up to 3.0 lbs. EAP and 150 hp.

* * *

The second bulletin — 16B9486 — gives the procedure for A-C standard C style pedestal mounted, ball bearing type machines up to 4.0 lbs. EAP.

* * *

Included in the bulletins are lists of standard ratings, dimensions and list prices for the single-stage centrifugal compressors.

* * *

Copies of "How to Select Single Stage Centrifugal Air Compressors" are available on request from Allis-Chalmers, Milwaukee 1, Wis.

Magnetostriction in Cobalt and Cobalt Alloys

A new publication on magnetostriction phenomena in cobalt and cobalt alloys is now available from the **Cobalt Information Center.**

* * *

The introductory section of this 60-page compilation outlines the reciprocal and nonreciprocal mechanical and magnetic effects on ferromagnetic materials produced by magnetization. More than 125 references to magnetostriction effects in cobalt and cobalt alloys are listed, covering technical literature from 1874 through mid-1959, are accompanied by informative abstracts and tables.

* * *

Some alloys included in the researches cited are: Kovar, Nivco, Alnico, Alcomax, Ticonal, 2V-Permendur, Invar, Perminvar, Vicalloy, Remalloy, Cunico, Hiperco, and Hycomax.

* * *

This publication is available by addressing requests on company letterhead to the Cobalt Information Center, c/o Battelle Memorial Institute, 505 King Avenue, Columbus 1, Ohio. Those from abroad should write to Centre d'Information du Cobalt, 35, rue des Colonies, Brussels, Belgium.

Slide-Rule Conversion Calculator

Determining total costs and savings in switching from brass to

For Fungus Resistance, Specify

TEXTILENE TWI-TAR

Offering great durability along with light weight, Textilene Twi-Tar is successfully used for buried communication cable (bedding and overall serving), expanded ACSR cable (expander between core and conductors), stationary power cable and portable cables.

Twitchell's superior Textilene line also includes: Moisture-resistant fillers — *Twi-Flex* and *Twi-Wax*. Used for non-metallic sheathed cable, maritime shipboard cable, varnished cambric cable.

Soft, dry fillers — *Twi-Port* and *Glascor** (Fiberglas-centered for high tensile strength without added bulk). Used for control, power, appliance, coaxial and communications cables, and all types of portable and flexible cords.

*Patent Applied For

For Every Wire and Cable Application
Twitchell's TEXTILENE Fillers Fill The Bill

Quality-controlled materials that are dependably uniform . . . in standard forms, or customized to special needs.

Initial low cost with savings added by production efficiency . . . flexible, ready-to-use fillers that fit all equipment, handle and form easily, always maintain desired shape.

Assured supply from a reliable domestic source . . . always available in economical and convenient packaging.

Proved performance as components of cables and wires that meet government specifications . . . stability shown by trouble-free installations in continuous service 20 years and longer.

FREE — SAMPLE SPOOLS of any type of Textilene filler to demonstrate the superiority of Twitchell materials in your operation — also technical counsel without cost or obligation. Just tell Twitchell your end-use requirements. *Write, wire, or phone today:*

E.W. TWITCHELL INC.

Third and Somerset Streets, Philadelphia 33, Pa. • REgent 9-7800

PAPER PRODUCTS FOR THE WIRE INDUSTRY

Twisted • Folded • Pressed • Crushed • Shaped • Braided • Woven

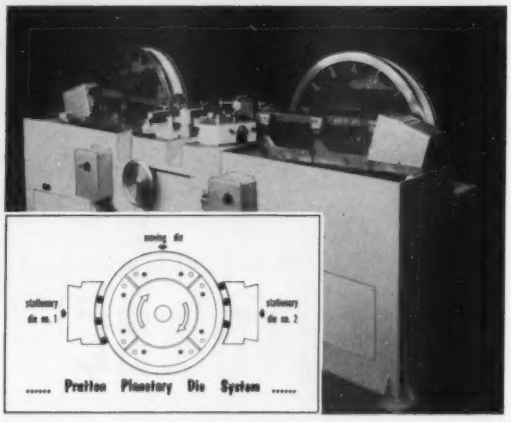
PLANETARY THREAD ROLLING MACHINE CUTS COSTS

Rolls Nails

48,000 PIECES PER HOUR

Designed exclusively for threading nails. This Prutton Planetary thread rolling machine can hammer up rolling production

500%



PRUTTON'S PLANETARY CIRCULAR DIE accounts for the tremendous increased production speed. Patented horizontal vibratory feed tracks feed nails to each side of the die in a continuous stream. The "lost motion" of the reciprocal type thread roller is completely eliminated.

Rolls nails at 600 to 800 pieces per minute. One customer reports a top speed of 1300 pieces per minute. A mere 150 pieces per minute represented top speed with this same customer on another make thread roller.

In addition to speed advantages the Prutton Model 125B-HV permits the operator to have complete access to the entire feed track and the inside of the hopper at all times. Total hopper capacity up to 150 lbs. Odd sizes and "bad blanks" can be quickly and easily removed without stopping the machine. There is absolutely no nail spillage. Working at this machine is like working at a bench. Loading height is a mere 36 inches.

HIGHER OUTPUT AND LOWER COSTS ADD DOLLARS TO YOUR THREAD ROLLING PROFITS . . .

A Prutton can be used for thread rolling, roll forming, knurling, marking, serrating and ne king of nails, bolts, screws and special parts in a wide range of sizes. Send prints and/or samples for free estimates on machine costs.

Write or Phone for Cost Saving Information TODAY!

Prutton
CORPORATION
5295 WEST 130th STREET
CLEVELAND 30, OHIO

Leader in Planetary Thread Rolling

JUST PIN THIS COUPON TO YOUR LETTERHEAD

PRUTTON CORPORATION
5295 W. 130th Street
Cleveland 30, Ohio
Dept. WP

Please send information on Model 125B-HV Thread Rolling Machine.

Name ..... Title .....
Company .....
Street Address .....
City ..... Zone ..... State .....

aluminum screw machine stock today is an ABC operation with **Aluminum Company of America's** new slide-rule type conversion calculator.

* * *

Exclusive in the aluminum industry, Alcoa's calculating instrument performs, in minutes, all major mathematical computations necessary to find cost ratios of a stock size of the two metals. Automatic allowance is made for operating scrap, bar end loss, and cutoff and facing losses.

* * *

To obtain a conversion calculator, contact any Alcoa sales office, or Alcoa distributor.

West Coast Company To Represent Peschel

Peschel Electronics, Inc. of Patterson, New York has just appointed **Thompson Associates** of the Los Angeles area to represent it in the State of California. This action has been prompted by the increasing number of electrical wire and cable plants locating in California. The wide experience of Thompson Associates in the wire industry should be beneficial to Peschel Electronics in the promotion of its new line.

Acrometal Products Opens Second Factory in Minneapolis

Outgrowing its main plant at 616 North 5th St., Minneapolis, **Acrometal Products, Inc.**, makers of spools, reels and special machinery for the wire industry, has leased an additional 15,000 square feet of factory space to take care of current demands.

* * *

Primary activity at this second factory will be production of Acrometal's Non-returnable Reel — a new product for the magnet wire industry that was still on the drawing board five years ago. Today Acrometal ships these reels by the carload to wire producers and processors countrywide.

* * *

This new reel, because of its accuracy and balance, makes it possible to package finer wire in larger volume than could be done

on wood and metal reels previously. Its low cost makes it practical to discard the reel after shipment, whereas wood and metal reels (at a higher initial cost) must be returned with resulting freight costs, maintenance, etc. The saving is significant.

* * *

Expansion of Acrometal into this extra production space has been dictated by the rapid growth

Segment of Production Line in Acrometal's Second Factory. * * * * * * * *

of its special machinery division. The company has acquired a reputation for developing special equipment and advanced processes for wire mills and wire processors — working sometimes independently on problems and at other times in collaboration with wire mills. Many new processes and special-function machines in wide use today throughout the wire industry were originally developed by Acrometal.

* * *

Among the latest of these newly developed machines is a Portable Wire Accumulator which eliminates production line delays at spool changeover periods, a new automatic Layer-Winder for square or rectangular wire (a knotty problem for years), a big custom-built electronically controlled machine for feeding fine wire through an annealing oven, and equipment for packaging as much as 1,000 lbs. of fine wire without any reel at all.

* * *

Fred J. Bieber, president and himself an engineer, keeps Acrometal's engineering staff constantly at work on new equipment to do old jobs faster and better. And

MATCHED COMPONENTS
mean Precision Extrusion Control

"Matched Component" wire Insulating Systems increase productivity and eliminate wasted capacity. From missile wire to transoceanic cable, D-S properly-designed components give better quality at lower cost.

- Wire line speeds up to 4000 feet per minute
- Reel sizes to 120" diameter
- Complete Systems for all types of thermoplastic and rubber insulating lines

Anything less than
D-S "MATCHED COMPONENT" capacity
is costing you money

• Get complete details by return mail •

PRECISION EXTRUSION CONTROL IS OUR BUSINESS

D-S thermatic

DAVIS-STANDARD
Division of
FRANKLIN RESEARCH AND DEVELOPMENT CORPORATION
8 WATER STREET, MYSTIC, CONNECTICUT

SALES DEVELOPMENT ENGINEERS

Extrusion and Molding Materials

Firestone Plastics Company has several challenging opportunities for men who are well grounded in the use of thermoplastic materials in the extrusion and molding industry.

The men we seek are currently employed as materials or process engineers in either the wire and cable or molding fields. They are thoroughly familiar with the properties and uses of thermoplastic materials, with emphasis on vinyl, nylon and polyolefins.

Successful candidates will be given a thorough grounding in the company's products and policies prior to entering sales development work. This work will constitute consultation on customers' problems, liaison between our technical service laboratory and the field, in addition to the sales development function.

Opportunity is excellent, and level of responsibility will be determined by the individual's qualifications and experience. Address inquiries in confidence to Sales Department, Chemicals Division, Firestone Plastics Company, Box 690, Pottstown, Pa.

Firestone

Plastics Company

Pottstown, Pa.

DIVISION OF THE FIRESTONE TIRE & RUBBER COMPANY

the fact that a majority of the wire mills and processors of the country now use Acrometal equipment indicates something of the progress made by Acrometal in its research and development program.

New Electric Furnace At Waukegan

The American Steel and Wire Division of United States Steel Corporation recently installed in its Waukegan, Illinois, plant, an electrically heated elevator type oven furnace, manufactured by **Sunbeam Equipment Corporation** of Meadville, Pennsylvania.

* * *

The furnace is used for annealing chrome nickel stainless steel wire prior to finishing, and was especially designed for American Steel and Wire's requirements.

* * *

The furnace operator, using a fork lift truck, brings a load of

Coils of wire being loaded onto the charge plug of the Sunbeam elevator furnace. * * *

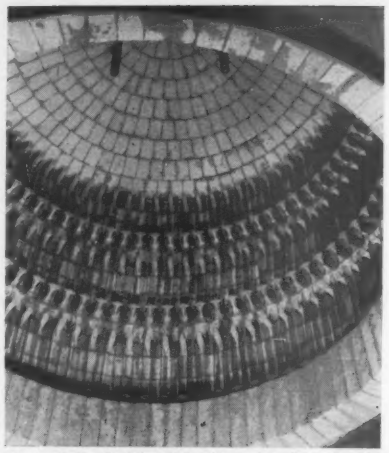
coiled wire to the furnace. The coil is placed on the elevator and the operator presses a button to raise the work into the heating chamber.

* * *

The electric heating elements are made of loop formed nichrome ribbon suspended on hangers and spacers, assuring even heating throughout the entire work load.

* * *

All temperature control instruments are mounted on a single panel provided by Sunbeam. Tem-



View of the inside of heating chamber showing a nichrome ribbon element suspended from hangers. This type of element provides uniform heat throughout the work load. * * * *

peratures are easily changed and automatically controlled to give the wire a uniform structure, uniform tensile strength, and other physical properties required.

New Morgan-Isley Brochure

The Morgan-Isley Division of the **Morgan Construction Company** of Worcester, Mass., has published a new brochure on its line of Combustion Control equipment. The new catalog is profusely illustrated with diagrams and photographs of installations. A special feature of the book is a series of three double page cut-away schematic drawings illustrating various applications of the Morgan-Isley Combustion Control equipment. Copies of the brochure can be obtained by addressing the Combustion Control Division of the Morgan Construction Company, 15 Belmont St., Worcester 5, Mass.

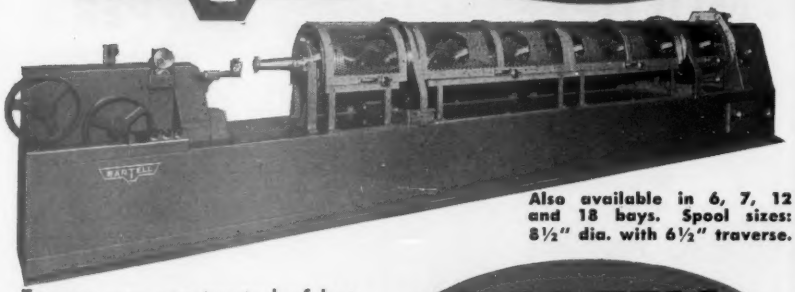
Stamford Processing Moves To Larger Plant

Charles J. Royle, President, **Stamford Processing Co.,** has announced the removal of his fine wire drawing mill from Peekskill, N. Y., to nearby Buchanan on Route 9.

* * *

The new quarters provide ample space on one floor for the wire drawing, spooling and special processing departments. The company, which was organized in 1951 by Mr. Royle and his associates, has expanded its operations several

BARTELL FOR THE BEST



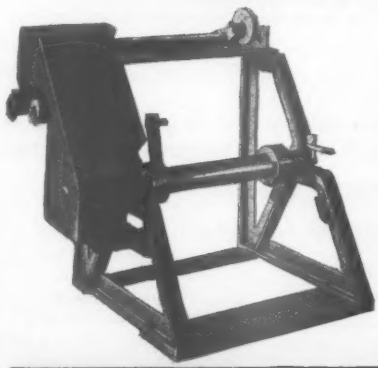
Also available in 6, 7, 12 and 18 bays. Spool sizes: 8½" dia. with 6½" traverse.

BARTELL SEVEN BAY HIGH SPEED STRANDER MODEL 7B-58-15

Frames are constructed of hot rolled shapes and plates to form a rigid box structure. Barrel is extruded 6062T-6 aluminum — Smooth starts through slip clutch driven by 7½ H.P. motor — Operators control station at front of machine — Main power control center at drive end — Electronically controlled automatic stop energizes solenoid operated brakes in event of wire breakage — Spool cradles and associated parts are completely interchangeable from one machine to another — Tungsten carbide wire guides throughout — Lay from ¼ in. to 5 in. long.

• CATERPILLAR CAPSTANS • SINGLE AND MULTIPLE HEAD RE-SPOOLERS • TAKE-UP & PAY-OFF STANDS FOR PLATING EQUIPMENT • WIRE STRANDERS

BARTELL TAKE-UP



This Take-Up is belt-driven, the drive originating from a slip clutch located outside the capstan box. Electrically operated traverse adjustable from zero to maximum reel width. Accommodates reels up to 30" dia. Speed selector sheave adjusts lay on reel to suit diameter of finished strand.

WE ALSO DESIGN AND BUILD SPECIAL EQUIPMENT TO MEET SPECIFIED REQUIREMENTS

BARTELL MACHINE-TOOL CORP.
YACHT CLUB ROAD ROME, N. Y.
• DESIGNERS • MANUFACTURERS • ENGINEERS • CONSULTANTS

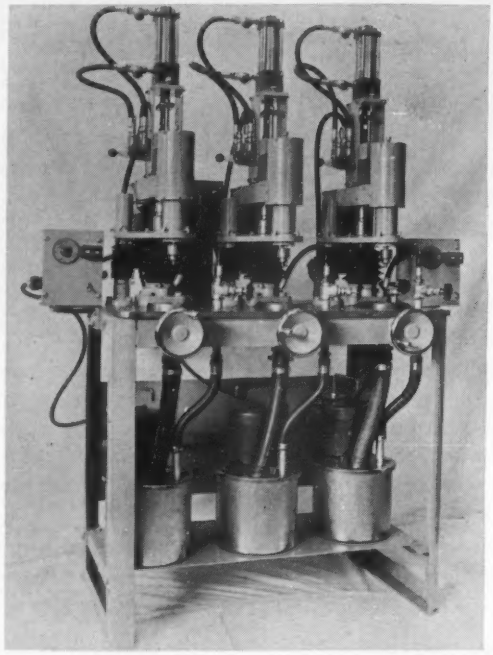
New DYKREX

automatic

MULTIPLE SPINDLE RIPPERS

Patent Pending, U. S. Patent Office

Single – Double or Triple Units



Available as a single spindle unit or in multiples of two and three. Each spindle equipped with a time switch. Abrasive pumps are located beneath the machine table; easily disconnected and cleaned.

RUGGED — hardened and ground-steel upright slides, protected with telescopic pipes.

FAST — Spindle is raised and lowered pneumatically . . . produces rough dies in a fraction of the usual time.

EASILY OPERATED — one man can operate up to 6 spindles at a time.

FACTORY TESTED — in leading wire mills.

Write for information and prices on this new line of Hi-Productive, Labor Saving, Automatic Rippers for Rough Die Finishing of Tungsten Carbide Dies.

DYKREX CORPORATION

P.O. BOX 9022, NORTH STATION, NEWARK 4, N. J.

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Huntington Park, California

J. A. Rod Co. Inc.
Houston, Texas

Sancliff, Inc.
Jefferson, Mass

J. T. Coppick Industries Limited
Toronto, Ontario, Canada

Allied Carbide Corporation
Jamaica, New York

Upton, Bradeen & James Limited
Toronto 5, Ontario, Canada

Glen Carbide, Inc.
Pittsburgh 19, Pa.

Smith-Courtney Co.
Hickory, North Carolina

Or ask your Tungsten Carbide Die Supplier

times in the manufacture of zinc, cadmium, metallizing and other fine wires, such as copper, silver, silver plated copper, tinned copper and alloys. The firm produces many specialty wires for special needs.

* * *

The new plant has approximately three times the manufacturing space of the old one and has been equipped with much new machinery for the manufacture of new types of wire.

* * *

Hodge Brothers Machine Shop of Ossining, N. Y. has consolidated with Stamford Processing as a division, which provides wire machinery construction service and maintenance. Hodge has designed and built most of Stamford Processing's equipment and made machines for many other wire mills.

* * *

Excellent shipping facilities on a railroad siding will facilitate good service to customers. The floor plan of the new mill has enabled the drawing, annealing, plating, inspection, and other departments to be separated and arranged for the efficient flow of work through the plant.

* * *

Sales are handled by **Robert Royle,** together with representatives located in the South, Midwest and on the West Coast.

Introduces New Line Of Lubricants

An improved and expanded line of lubricants for wire drawing and other metalworking requirements has been announced by the Soap Department of **Swift & Company.** Identified as Fleximet products, this new line supplants the less extensive group known as Flexals.

* * *

The name **Fleximet** now will identify those lubricants made especially for the metal trades and will prevent their being confused with any of the many other metallic complexes made by Swift & Company.

* * *

Major products currently available are the following:

FLEXIMET M2DS — compounded to help upgrade production rates on "tough jobs" such as drawing mechanically descaled rod, high manganese steel, etc. It may be used for multiple drafting at high speeds. Described in Bulletin 45.

FLEXIMET PCM — fortified with extreme pressure additives to provide a protective, non-reactive coating which remains stable even after being subjected to stress relief heat treatment. Described in Bulletin 46.

FLEXIMET S — engineered for both dry drawing or hot dip — dry film lubrication. It is an exceptionally rich 80% sodium stearate with rust inhibitor and bonding aid added. It may be used with either phosphate or borax precoat. Described in Bulletin 26.

FLEXIMET MCF — a versatile, fine mesh lubricant for high speed drawing. May be used for either high or low carbon steel, aluminum, stainless, and titanium alloys. It contains less than 0.5% moisture. Described in Bulletin 25.

FLEXIMET MCL — a lean lubricant for cold heading. It is especially formulated to provide protection and quick release — without excessive build-up on heading dies. Described in Bulletin 44.

FLEXIMET MCA — a high titer calcium stearate complex for high speed multiple-hole draw benches. Described in Bulletin 24.

* * *

Any or all of the bulletins mentioned above are available from **Swift & Company,** Soap Department, Chicago 9, Illinois.

* * *

Other related products will be added to the line in the near future.

Spool Manufacturer Moves Into Larger Plant

The Plastic Mold & Engineering Company has moved its plant and offices from down-town Providence to 265 Wampanoag Road, East Providence, R. I. The new plant, with double the floor space and much new equipment, now will be better able to keep pace with the growing demand for the company's products. Quarters for the Engineering Department also have been considerably expanded.

* * *

The company has engaged for many years in the design and manufacture of plastic spools for fine wire processing and shipping, braiding machine bobbins, and cop holders, for which polystyrene and nylon are used because of their

Your best buy...

124-INCH DIAMETER
50 TON CAPACITY
STEEL REEL
for oil filled cable

BETTER QUALITY
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NYECO

Steel Shipping Reels

ASSURE SAFE DELIVERY of your cable with rugged, weather resistant, splinter-proof NYECO steel reels. Protects costly cable against damage in shipping and processing due to dropping, bouncing, rough handling. Costs little more than wooden reels... lasts up to 10 times longer... requires minimum maintenance.

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WHAT ARE YOUR REQUIREMENTS?

Send specifications for STEEL SHIPPING REELS, IMPREGNATING REELS, PROCESSING REELS, SUBMARINE CABLE REELS AND BRIDGE REELS. Prompt deliveries on large or small orders.

OTHER FINE NYECO PRODUCTS

- Impregnating Tanks
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ANY QUANTITY — ANY SIZE — ANY FLANGE DIAMETER from 42" up

Specialists to the wire industries for over 50 years.

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In use in over 200 Cable plants—and in more than 30 countries

Typical small Extrusion Control Station, combining Automatic Capacitance with Size Control and Recording

Small Extrusion Control Station incorporating Optical Diameter Control and Eccentricity Monitoring.

Ingenious system of building blocks permits extension, modification, and assembly of hundreds of different combinations of Control Stations, to individual requirements, at moderate cost.

ADDISON'S UNIQUE RANGE OF UNITIZED SYSTEMS COMPRISE

- Cable Eccentricity Monitors and Controllers
- Wire Preheaters with Automatic Temperature Control
- Corona Test Sets for scanning and final tests
- Optical scanning Size Monitors and Controllers
- Wall Thickness and Dual Plane Controllers
- Contact Size Monitors and Controllers
- Capacitance Monitors and Controllers
- High Frequency and D.C. Spark Testers
- Cable Impregnation Monitors
- Wire Tension Gages — etc.

SALES & SERVICE: **MUIRHEAD INSTRUMENTS INC.**
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432/3

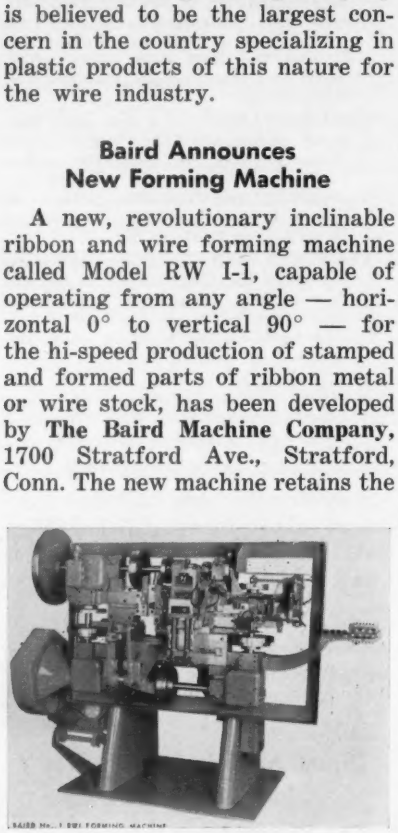
unusual high impact strength and durability.

* * *

With its modern and complete tool room facilities for the making of dies for plastic molding and its excellent engineering staff, the firm is in an ideal position, not only to turn out exactingly made spools, but to produce spools and bobbins to customer's specifications. Plastic Mold and Engineering Company is believed to be the largest concern in the country specializing in plastic products of this nature for the wire industry.

Baird Announces New Forming Machine

A new, revolutionary inclinable ribbon and wire forming machine called Model RW I-1, capable of operating from any angle — horizontal 0° to vertical 90° — for the hi-speed production of stamped and formed parts of ribbon metal or wire stock, has been developed by **The Baird Machine Company,** 1700 Stratford Ave., Stratford, Conn. The new machine retains the



Baird Model RW1-1 Forming Machine. * *

many advantages of a horizontal machine, but offers numerous additional benefits.

* * *

The result of an extensive survey among 4-slide users to determine what features **they** wanted in a forming machine, the RWI-1 is said to be the first major development in wire and ribbon forming machines in 25 years. Working from the data collected, Baird's Engineering Department designed the new machine to produce a highly flexible and versatile machine suited to small shop production or large automated manufacturing industries.

Because of its flexibility, the machine affords considerable time saving in tool set-up and maintenance. It will form and eject a part without restriction due to its operating angle. Standard equipment includes a variable speed motor, automatic lubrication, split cams at all forming positions. Among the many features are: inclinable operating capabilities, a versatile design form bracket with two vertical motions and a dual mounting symmetrical press unit which can be mounted at front or rear of metal line. Press units are rated for 4 tons; two units can be mounted.

* * *

Due to its design, the RWI-1 machine can be utilized with automatic receiving equipment, including conveyor, rotary table stacking units, horizontal arbor for applying adhesives, etc. The machine will accept feed lengths up to 8½", wire diameter mild steel to 3/32" and ribbon metal stock widths to 1½". It can turn out 75-300 parts per minute at normal speed with a variable speed drive. Production can be increased to 400 parts per minute by incorporating high speed cams and short feed.

To Represent Standard-Toch On West Coast

Effective August 1, 1960 **Standard-Toch Chemicals, Inc.** will be represented on the West Coast by **Thompson Associates,** 1360 Garden La., Menlo Park, Cal. Standard-Toch manufactures a complete line of asbestos saturants, cable lacquers, finishing compounds, marking inks and specialty items for both military and commercial application.

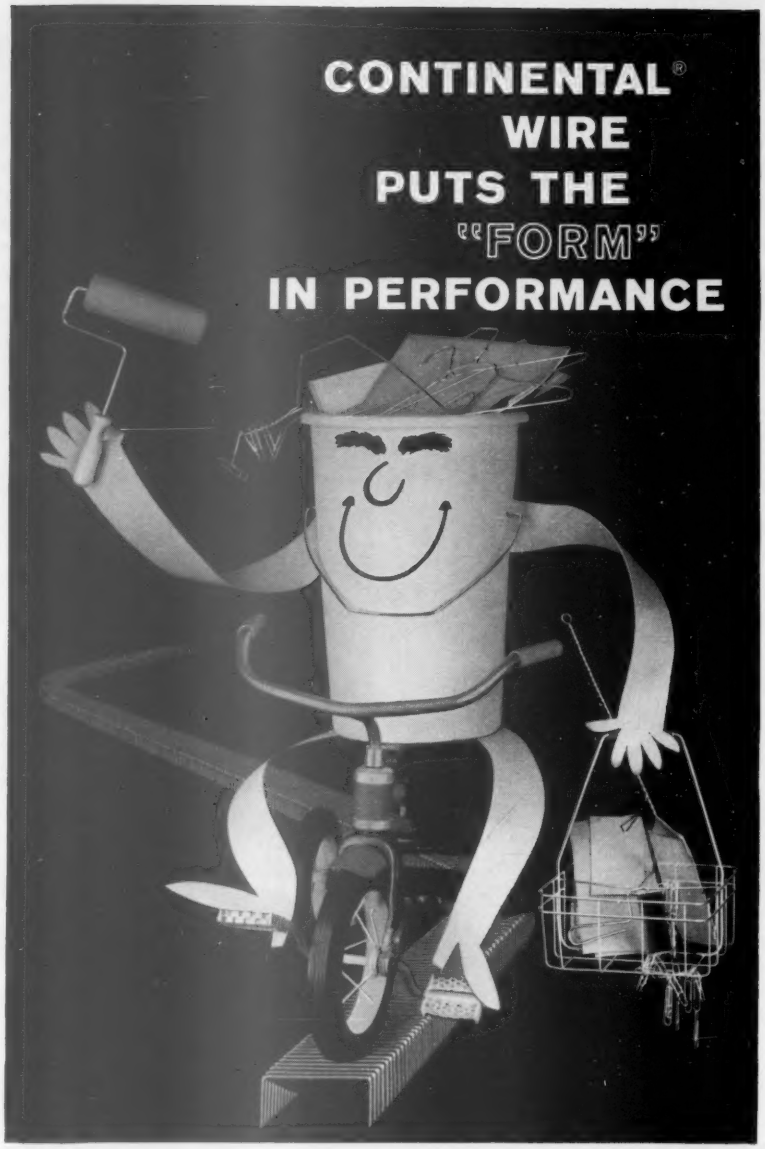
* * *

A leader in the field of wire and cable finishes, Standard-Toch anticipates an expansion of the distribution of its products through Thompson Associates.

1960 BUYERS' GUIDE

Have you ordered your copy?

Price: $5.00



Formability that permits difficult twists and bends . . . sustained fast production in coil after coil . . . smooth tight coatings that do not powder, flake or peel to jam machines. Such wire calls for consistent, uniform quality. You can get it at Continental, in sizes and finishes to meet most specifications—from 7/16" on down to 40 gauge, in various tempers and analyses, in low and medium low carbon steels. Special shapes, too. Why not let our mill technicians work with you on any problems you may have pertaining to wire fabrication. We may have the answer to a particular need. Write today for your FREE copy of our new wire manual.

Wire Specialists for over half a century

CONTINENTAL STEEL
CORPORATION KOKOMO, INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright and special shaped wire. Also Welded Wire Reinforcing and Galvanized Fabric, Nails, Continental Chain Link Fence, and other products.

Outstanding Personalities of the Wire Industry

Westphal Retires; Succeeded By Burcham at Armco

Robert F. Kuhnlein, vice president and general manager of **Sheffield Division, Armco Steel Corporation,** has announced the retirement of **F. A. Westphal,** manager of the Sand Springs, Oklahoma works. His retirement will be effective on July 1, 1960. He will continue as a consultant to the Armco's Sheffield Division.

* * *

The new manager, succeeding Mr. Westphal, is **W. J. Burcham,** former assistant manager at Sand Springs.

* * *

Mr. Westphal's retirement brings an end to a career of more than 43 years of service to the steel industry. For over the past 32 years he has been associated with Sheffield Division. He came to Sheffield in 1928 as the founding and designing superintendent of the rod and wire mills at the time when the Kansas City works was pioneering the manufacture of rod and wire metallurgy and wire products for the mid-continent area.

F. A. Westphal

* * *

In 1941, he was promoted to division manager at Houston at the time the Texas plant commenced engineering and construction. He was called into the Navy as a Commander in 1943 and served as an industrial engineer and procurement officer under the Chief of Naval Material and was officer in charge of naval plant seizures of the rubber and oil industries in 1945 thru early 1946. When he returned from service in 1946, Mr. Westphal became manager of the Sand Spring works.

* * *

Mr. Burcham was first employed by the Sand Springs plant in 1941 as a crane hooker. He worked his way up through the ranks to strander, heater and roller. In 1947 he was made acting superintendent of rolling mills, which became per-

Glader—Years of Proven Performance
GLADER NAIL MACHINES
55 YEARS of experience meeting the exacting demands of nail making.
The machine with a record of steady dependable service.
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manent in 1949. He remained in this capacity until August 1959, when he was promoted to assistant manager of the Sand Springs works. Mr. Burcham attended the University of Tulsa.

* * *

Mr. Westphal began his career in the steel industry as a foreman-engineer with U. S. Steel Corporation at Worcester, Mass., in 1917, eventually specializing on wire rope and bridge wire engineering. He joined the Jones and Laughlin Steel Corporation in 1922 at Aliquippa, Pa., where he was assistant superintendent of the rod and wire mills. During this period he initiated continuous wire drawing, the development of high carbon steel and wire, and special galvanizing processes for wire.

W. J. Burcham

* * *

He attended the U. S. Naval Academy at Annapolis from 1914 to 1917 where he was active in athletics and was varsity fullback in 1914-1916. During World War I, Mr. Westphal served in the American Expeditionary Forces in France as an officer in the U. S. Army 6th Field Artillery, First Division. He was decorated with the Silver Star, Purple Heart with palm and the Croix de Guerre.

Heil Appoints Manager of Rigidon Plant

Robert I. Peters has been named Manager of the Rigidon plant of **Heil Process Equipment Corporation** of Cleveland, Ohio. He will be in charge of all manufacturing, estimating, and product promotion of the company's Rigidon reinforced plastic corrosion resistant process equipment including fume scrubbers, fans, tanks, tank covers, hoods, ducts, stacks, and accessory equipment.

* * *

He joined the company in 1946

Robert I. Peters

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Type AM — Illustrated has these features:

1. FINE VERTICAL AND HORIZONTAL ADJUSTMENTS PROVIDE PERFECT MARKING ON WIRES OF .010" TO 3.00" IN DIAMETER.
2. ACCOMMODATES FLAT, CONCAVE, OR SPECIAL WHEELS.
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West Coast Representative: Paul I. Kenner Co., 230 Shaw Rd., So. San Francisco, Calif.
West Germany: Walter G. Fritzke GMBH, AM Wehrhahn 94-96, Dusseldorf, W. Germany

and has been Estimator, Sales Engineer, Western Division Sales Manager, and Assistant Chief Engineer. He is a graduate of Fenn College in Mechanical Engineering.

Cleveland Crane Reorganizes Sales Department

H. T. Florence, Executive Vice President & General Manager, has announced that effective June 1, 1960, all sales activities of **The Cleveland Crane & Engineering** Co. will be consolidated into one Sales Department under **Robert G. Birkin,** General Sales Manager, and **J. G. Frischkorn,** Sales Manager.

* * *

The new department will be responsible for the sale of heavy overhead traveling Cleveland Cranes, Cleveland Tramrail overhead materials handling equipment, Steelweld metal-cutting shears, press brakes, straight side and Speed-Draw Presses.

* * *

Mr. Birkin has been with the company for 33 years. Last year he was appointed Sales Manager of the Heavy Machinery Division. Mr. Frischkorn was Sales Manager of the Cleveland Tramrail Division. He has also worked in the Engineering Department.

Made V.P. — Mfg. By American Brass

Robert S. Baker has been appointed vice president-manufacturing of **The American Brass Company.** The appointment became effective July 1. Mr. Baker, director of mill operations since 1952, succeeds **Sydney H. Wardell,** who will retire. The announcement was made by **Richard M. Stewart,** company president.

* * *

Mr. Baker received a B.S. degree in metallurgy from Yale University in 1925. That year he started with American Brass as a trainee in the company's laboratory. In 1935, he was appointed service engineer at the company's headquarters in Waterbury, and in 1939, he was appointed technical supervisor to the Torrington division.

* * *

He became assistant works manager of the Torrington division in 1946, and its works manager in 1948. Four years later, Mr. Baker returned to the company's headquarters as director of mill operations.

Union Carbide Names Executives

The following changes in Union Carbide management were announced today by **Howard S. Bunn,** president: **Hermann K. Intemann** was named director of purchases for **Union Carbide Corporation, William H. Feathers** was appointed president of **Union Carbide Metals Company,** and **James R. Johnstone** was made president of **National Carbon Company.**

Carwin Appoints Plant Manager

Robert E. Ward was appointed Plant Manager of **The Carwin Company's** North Haven, Conn., plant, **D. A. Bender,** Vice Presi-

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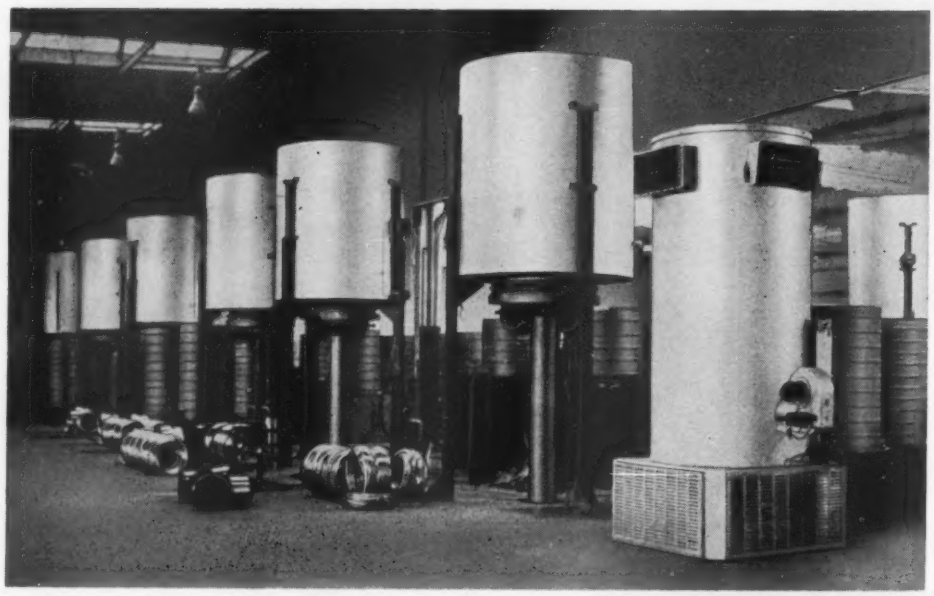

SEVERAL VACUUM BRIGHT ANNEALING UNITS WHICH WE HAVE INSTALLED IN ONE OF THE MOST PROMINENT CABLE WORKS IN GERMANY

(German and Foreign Patents)

*

SOLE REPRESENTATIVE:
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OFENBAU **FRITZ** G. m. b. H. & Co. K. G. **HAGEN,** (W.-GERMANY)

dent, has announced. He is a graduate of Williams College, and was previously a production supervisor for General Aniline and Film Corporation in Linden, N. J.

* * *

Specialty isocyanates, high temperature polyurethane foam systems and organic chemicals are produced at Carwin's North Haven plant.

J & L Elects New President

Charles M. Beeghly has been elected president of **Jones & Laughlin Steel Corp.**, Pittsburgh, Pa. Mr. Beeghly has served as executive vice president since 1958, and as a director of the corporation since 1957. **Avery C. Adams**, who has served as chairman and president, will continue as chairman and chief executive officer. Mr. Beeghly was president of the J & L Strip Steel Division with headquarters in Youngstown, Ohio, until elected executive vice president of the corporation.

Heil Appoints Cleveland Manager

R. F. Protiva has been named Manager of the Cleveland plant of **Heil Process Equipment Corp.**, in charge of manufacturing, estimating, and product promotion of the company's line of chemical resistant process equipment including lined acid tanks, Nocordal impervious graphite heat exchange equipment, steam jet agitators and numerous corrosion resistant linings.

R. F. Provita

* * *

Mr. Protiva joined the company as Sales Engineer in 1940 following his graduation from Case Institute of Technology with a degree in Metallurgical Engineering. He became Manager of Process Industry Sales in 1956, Eastern Sales Manager in 1957 and Manager of Market Development in 1959. He is a Registered Professional Engineer.

To Head Product Development For Escambia

It has been announced that **Dr. Earl W. Lane** has joined **Escambia Chemical Corporation** in the position of Manager, New Product Development, Commercial Development Department, according to **A. N. Wohlwend**, Vice President and Director of Commercial Development. Dr. Lane will have his headquarters in New York and be responsible for the development of new products which come from

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HOT-DIP TANK TINNER

you can enjoy production up to
20,000 FEET A MINUTE!*

Yes, here is America's most advanced-design tinning installation. Fully complete because it includes a supply stand, flux pot with dip rods and wipes, tinning tank with burner and automatic temperature control units, water cooling tank with recirculating pump and high-speed take-up that maintains constant linear speed. Remember, every part of this machine can be built to suit your own particular individual needs.

* Using 20 lines of fine wire

Check these
FEATURES

- Very flexible in its design
- Gives wire perfect uniformity
- Uses improved wiping method and dip rod construction
- Cannot produce rough wire
- Built of rugged, all welded parts
- Takes 12 to 20 lines or spools
- Up to 1000 ft. per minute speed
- Low initial investment

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Wire and cable processing and fabricating machines

Escambia's research program or ones which may be acquired from outside sources. Dr. Lane obtained his BS from the University of Illinois and his Doctorate in Organic Chemistry at the University of Colorado.

Crescent Co. Changes

As part of an extensive program of expansion, **John M. Sapinsley,** President of **The Crescent Co., Inc.** and its **Carol Cable Company Division,** of Pawtucket, R. I., announced the election of two Vice-Presidents and the appointment of a Controller and a General Foreman, effective immediately.

* * *

Kenneth R. MacLean has been elected Vice President — Sales; **Louis F. Palana,** Vice President — Operations. **David J. Murphy** was named Controller, and **William E. Ethier,** General Foreman.

* * *

Mr. MacLean has been with the company since 1950, having served as Sales Manager of the Automotive Division and later General Sales Manager of the Automotive, Industrial, and Electrical Divisions. Mr. Palana has held a variety of supervisory positions with the company since 1936. He has been a Supervisor, Foreman, Production Superintendent, and most recently, Plant Superintendent. Mr. Murphy, a C.P.A., joined Crescent as Chief Accountant in 1958. Mr. Ethier started for the company as a production worker in 1933. Before being named General Foreman he held positions as Supervisor and Foreman in Crescent's Pawtucket plant.

New Directors Added

The election on June 17 of **J. A. W. Iglehart** and **B. D. Williams** to the Board of Directors of **National Wire Products Corporation,** Baltimore, Md., has been announced by **H. Clifford Youngen,** President.

* * *

Other directors of the company are **E. Clyde Grimm,** Chairman, **Mr. Youngen, F. N. Barnes, J. M. Cook, Clifford Faust, R. C. Faust, and C. A. Waite.**

* * *

National Wire Products is the largest independent producer of welded wire concrete reinforcing fabrics on the Eastern Seaboard. Founded in 1955, the company now occupies a new 50,000 sq. ft. plant and a 23,000 sq. ft. warehouse in Baltimore. It also has a manufacturing subsidiary, **National Wire of Florida,** in Tampa.

To Represent G.E. in Texas

William D. Trammell has been appointed sales representative for the Western District of the **Silicone Products Department,** General Electric Co., Waterford, N. Y. His office location is 6500 Cedar Springs, Dallas, Texas.

* * *

A 1957 graduate of Texas Technological College with a Bachelor of Science degree in chemical engineering, he was first employed by G. E. in 1959 on the engineering

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42" x 20" x 21"—(4000# cap.)

Heavy Duty

BREAK-DOWN REELS

1000#
2000#
4000#
} capacities

Rugged Design including patented DURA-CURL rim, and many other features necessary to provide the *Strength* and *Durability* needed for continued successful performance.

Also complete line of sizes of Modern High Speed Wire Drawing NO-CREV Spools and Reels for both fine and intermediate size wire.

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science program. He joined the sales force of the Silicone Products Department at Waterford last October.

American Brass Changes At Torrington

Gilbert C. Strubell, plant manager of **American Brass Company's** Torrington division, has been appointed administrative director of metallurgy and research. The announcement was made here by **John R. Freeman Jr.,** vice president — metallurgy and research. **Lucius H. Bassett,** formerly works manager of the Anaconda Aluminum Company's plant at Terre Haute, Ind., has been named to succeed Mr. Strubell. These changes became effective as of July 1.

* * *

Mr. Strubell received his B.S. in chemistry from Brown University in 1931. He has been with American Brass since 1937. Mr. Bassett graduated from Middlebury College in 1925 and started his career with American Brass at the Torrington division in 1927.

Made Manager of Borden's West Coast Plant

Appointment of **Carl E. Drugge** as works manager of the Compton (Los Angeles), California plant of **The Borden Chemical Company,** A Division of The Borden Company, has been announced by **R. T. Hanson,** general manager, western operations.

* * *

Mr. Drugge joined The Borden Chemical Company in 1953 as a chemical engineer at the Seattle, Wash., laboratories. In 1956, he was transferred to the Compton, California plant and promoted to the position of production engineer. He received his B.S. Degree in chemical engineering from the University of Washington in 1953.

Wireco Man Heads WRI

Bruce D. Bennett, Manager, Construction Material Sales, **American Steel & Wire Division, United States Steel,** was named president of the **Wire Reinforcement Institute** at the recent annual meeting of the U. S. and Canadian trade association of welded wire fabric manufacturers.

* * *

The new WRI president attended Pennsylvania State College. He spent several years in various apprenticeship training courses with American Steel & Wire, after joining the Division in 1935. In 1957, he was promoted to manager, construction material sales, for the entire division, with offices in Cleveland.

Named to Key Posts By Dodge Fibers

Dodge Fibers Corp., Hoosick Falls, N. Y., has announced the appointment of **S. Whitney Dickey** as Manager of Distributor Sales. He will form and administrate an organization of manufacturers' representatives to sell Dodge Fibers' line of heat-resistant electrical insulations and other materials. He is a graduate of Yale University.

* * *

Also appointed was **William Pe-**

STRANDING ?

ALL TYPES OF STRANDING MACHINERY FOR ELECTRIC CABLE & WIRE ROPE INDUSTRIES — RIGID MACHINES, TUBULARS, LOCKED COIL OR HALF-LOCK MACHINES.

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ILLUSTRATION 781.

36 REEL PLANETARY STRANDING MACHINE

FOR 16" OR 405 M.M. REELS. FITTED WITH TWO COMPACTING HEADS FOR ROUND STRAND. FOR COMPACTING TO 90% OF THE ORIGINAL DIAMETER ON COPPER OR ALUMINUM.

ALSO SHOWN IN ILLUSTRATION 781 ARE THE FAMOUS "CARTER" SPLIT CRADLES FOR EASY MAINTENANCE & ASSEMBLY.

ILLUSTRATION 780.

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titt, with Dodge Fibers since 1956, as Manager of Technical Sales. He will be responsible for sales to industrial users such as packaging machines and electrical equipment manufacturers.

Battelle Appoints Engineers to New Posts

Two veteran **Battelle Memorial Institute** metallurgists, **Dr. Robert I. Jaffee** and **George K. Manning,** have been named Technical Managers in the Department of Metallurgy at the Columbus, Ohio, research center. Both joined the Battelle staff in 1943.

* * *

According to **J. Harry Jackson,** Department Manager, both Jaffee and Manning will direct activities in the fields of process metallurgy, mechanical metallurgy, physical metallurgy, fabrication metallurgy, chemical metallurgy, and metallurgical engineering.

* * *

Mr. Manning has guided and participated in the development of high-temperature alloys, steels, and other ferrous alloys. Dr. Jaffee has been closely associated with research on the less familiar metals, including titanium, zirconium, molybdenum, tungsten, tantalum, chromium, rhenium, and columbium.

G.E. Silicone Department Appointment

Harold W. LeBoeuf has been named manager of manufacturing of **General Electric's Silicone Products Department** at Waterford, N. Y., it has been announced by **Jerome T. Coe,** department general manager.

* * *

He succeeds **Dr. James R. Donnalley** who recently assumed the post of general manager of the Company's Insulating Materials Department in Schenectady, N. Y. Mr. LeBoeuf first became associated with General Electric in 1937 while a student. He graduated from Iowa State College in 1940 with a B.S. degree in Chemical Engineering.

Other Silicone Department Appointments

James E. Hamlin, has been appointed sales representative for the East Central District of the Silicone Products Department of the **General Electric Company.** His office location is 1503 Brookpark Road, Cleveland, Ohio.

* * *

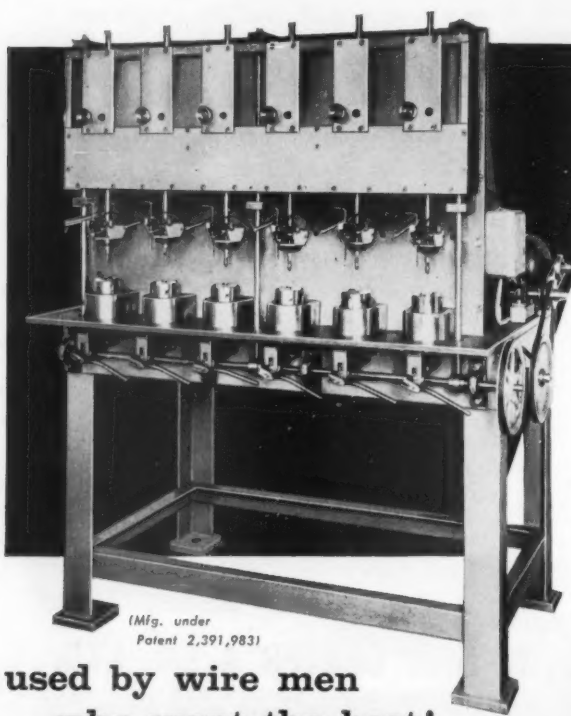
Also, R. L. Harden was appointed sales representative for the Eastern District with offices at 1405 Locust Street, Philadelphia, Pa. He replaces **L. J. Sacks** who was recently appointed to fill the position of Western District Sales Manager.

American Brass Makes Buffalo Division Appointment

The American Brass Company has announced the appointment of **George W. Wyckoff** as assistant sales manager of the company's Buffalo Division.

* * *

Until now Mr. Wyckoff has been district sales manager of the com-



used by wire men
who want the best!

Sjogren
AUTOMATIC
DIE SIZERS

Another SJOGREN-BUILT Machine for "wire men who want the best!"

This Automatic Die Sizing Machine is available in 2 models — the Six Spindle (as shown) and the Single Spindle unit. Both models are identical in construction and the same production per spindle applies. Typical production per spindle, per hour, on the six spindle machine is:

2 dies at .165"	8 dies at .082"
4 dies at .135"	10 dies at .072"
6 dies at .095"	15 dies at .062"

(Total of 45 dies or more, per hour)

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WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • GAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

pany's Rochester, N. Y., sales office. He will be succeeded at Rochester by **Charles V. Hower, Jr.**, a sales representative in the company's Cleveland office since 1948.

Two Men Elected Vice Presidents

At the annual meeting of **Stanley-Humason, Inc.**, subsidiary of The Stanley Works, Forestville, Conn., held on March 25, **Frederick R. Downs, Jr.**, formerly sales manager, was elected vice president, sales, and **Peter D. Prudden**, plant manager, was elected vice president, manufacturing.

* * *

Mr. Downs has been sales manager since 1953, following his appointment as assistant sales manager in 1951. He joined Stanley-Humason as an estimator in the purchasing department in 1940. He is a graduate of Dartmouth College.

* * *

Mr. Prudden joined Stanley-Humason in 1946 as a junior engineer and became a plant engineer in 1948. Subsequently he became plant manager. He is a graduate engineer of Lafayette College.

R B & W Names Technical Advisor

Charles S. Brown has been appointed to the position of technical advisor at Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y., according to an announcement by **Fred E. Graves**, assistant technical director.

* * *

Mr. Brown will assist Mr. Graves is an expanded program of technical service to customers in evaluating assembly practices and applications of threaded fasteners to improve assemblies and reduce costs.

* * *

A 1954 graduate of the United States Military Academy, with a Bachelor of Science degree in military engineering, he attended the Graduate School of Business Administration, Syracuse University.

To Manage Borden's Plastic Sales

Appointment of **M. C. Wakefield, Jr.** to the position of sales manager of the **Polyco-Monomer Department** of **The Borden Chemical Company**, A Division of The Borden Company, has been announced by **C. W. Smith**, general manager.

* * *

Mr. Wakefield joined Borden Chemical in 1957 as mid-west district sales manager. In his new position, he will direct the sales organization of the Polyco-Monomer Department in all product and industry areas. He holds a degree in Chemical Engineering from the University of Texas in 1946.

Borden Chemical Appoints Engineering Manager

Appointment of **Thomas L. Trafford** as engineering manager for the Resins & Chemicals Depart-

EVG COVERS THE WHOLE FIELD OF WELDED WIRE FABRIC

1. *Heavy Duty* model G 6—designed to handle the heaviest meshes in use, i.e. pipe mesh.

2. *Standard Duty*—handles all constructions specified by engineers for reinforcing road fabrics.

3. *Medium Duty*—a specialized machine for the low-cost production of building mesh and similar fabrics.

4. *Light Wire* machine—a high precision welder, specifically designed for the production of visual type fabrics; fencing, mink batteries, etc.

5. *Fine Wire* machine—an extra high speed, flexible changeover welder. Particularly suited to the production of welded hardware cloth in all gauges and spacings.

COMPLETE LINE OF FULLY AUTOMATIC WELDING EQUIPMENT

Please direct inquiries to: Richard E. Kleinhans, U.S.-Canadian Representative, 122 East 42nd St., New York 17, N.Y. OXford 7-0770

ment of the **Borden Chemical Company**, A Division of The Borden Company, has been announced by **R. J. Lodge**, general manager.

* * *

In his new capacity, Mr. Trafford will be responsible for all phases of the department's engineering requirements at the Bainbridge, N. Y., Browntown, Wisc., Demopolis, Ala., and Fayetteville, N. C. plants.

* * *

Mr. Trafford received a B. S. degree in Mechanical Engineering from New York University in 1936 and a B.S. degree in Aeronautical Engineering in 1937. He will make his headquarters at the company's Bainbridge, N. Y. plant.

Elected To ACCO's Board of Directors

Harry Williams, vice president in charge of sales of the Automotive & Aircraft Division, **American Chain & Cable Company, Inc.**, with headquarters in Detroit, Mich., has been elected as a member of the Board of Directors according to an announcement by **Cyrus N. Johns**, president and chief executive officer.

* * *

Mr. Williams, associated with the corporation since January, 1927, when he joined the American Cable Division as a sales engineer, was instrumental in founding the Automotive & Aircraft Division in 1937. This division now has plants and offices operating in Adrian, Mich., West Pittston, Pa., and Fairfield, Iowa.

James M. Scott

James M. Scott, 50, general plant manager and treasurer of **Scott Testers, Inc.**, Providence, R. I., was fatally stricken June 19 while vacationing on his cabin cruiser in Narragansett Bay. Death was caused by a heart attack.

* * *

Mr. Scott, a prominent industrialist, was also president of

James M. Scott

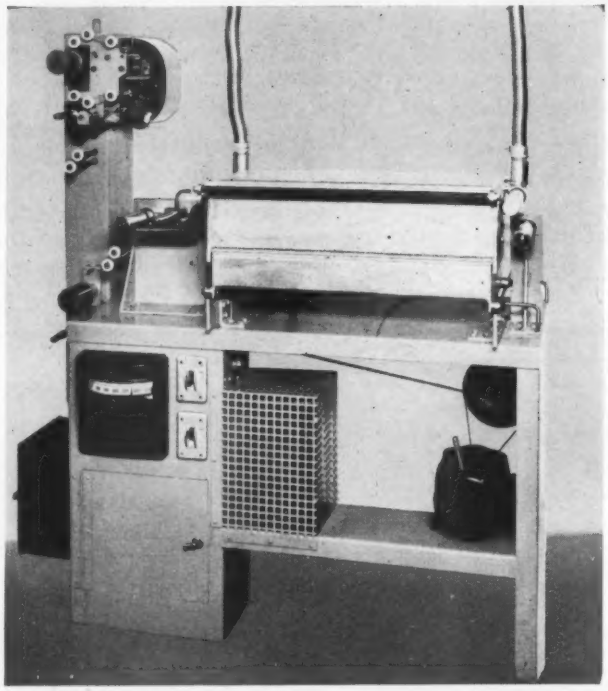
Scott Testers Southern, an affiliate of the Rhode Island parent company with offices in Spartanburg, S. C. A son of **David C. Scott**, founder of Scott Testers, Inc., and the brother of **David C. Scott, Jr.**, president of the company, he spent his entire business career with this firm which manufactures physical testing equipment for textiles, rubber, plastics, wire, and other industries.

* * *

Mr. Scott was a past president of of the Rhode Island Rubber Club,

HORIZONTAL FINE WIRE ENAMELING MACHINE

1247



SPEEDS 50-200 F. P. M.—WIRE SIZES DOWN TO .0005
EASY STRING UP

"American" AIMCO INSULATING MACHINERY COMPANY
FAIRHILL AND HUNTINGDON STREETS
PHILADELPHIA 33 PENNSYLVANIA U.S.A.
MANUFACTURERS OF WIRE INSULATING MACHINERY AND ALLIED EQUIPMENT. MACHINERY MFG. TO CUSTOMERS SPECIFICATIONS.

We manufacture a full line of enameling machines from the heaviest flat wires to the smallest diameters.

OTHER PRODUCTS:

Taping machines; tinning outfits; spoolers; insulation winding machines; special machinery according to customers' specifications.

a division of the American Chemical Society, and a former member of the executive board of the industrial instrument division of the Scientific Apparatus Makers of America.

* * *

He was also a past president of the Rhode Island Branch, National Metal Trades Association, and had been an assistant regional director of that association, working closely with the organization in an advisory capacity for many years.

* * *

Mr. Scott had attended Moses Brown School, Tabor Academy, Bryant College, and Massachusetts Institute of Technology. He was a member of the Chemist Club of New York, and the Providence Engineering Society.

Eugene van Thiel

Eugene van Thiel, Managing Director of Nederlandse Schroefboutenfabrik N. V. Helmond, Holland, passed away late in May, 1960. Mr. van Thiel had been a member of The Wire Association.

Appointments at Seneca Wire

John Howard McNerney has been elected President of **The Seneca Wire and Manufacturing Company,** Fostoria, Ohio, and its subsidiary **Keystone-Seneca Wire Cloth Company,** with plants at Hanover, Pa. and Brookhaven, Miss.

* * *

Mr. McNerney previously served as Secretary-Treasurer of the Owens-Illinois Glass Company and President of Owens-Illinois Plywood Company. In 1958 he retired as officer and director of Owens-Illinois Glass Company and subsidiary companies. He also serves as Seneca's Chairman of the Board.

* * *

Other officers include **H. L. Martin,** Vice President, **Eugene F. Howard,** Vice President and Secretary, **F. A. Bormuth,** Vice President-Treasurer and **M. G. Jacoby,** Assistant Treasurer.

* * *

Also announced were the appointment of **W. J. Paine** as Plant Manager, succeeding C. E. Turk, recently resigned; and William Zimmerly as Purchasing Agent & Traffic Manager, succeeding L. J. Schreiner, who retired after many years of service.

Describes Uses for Silicones

How silicones aid appliance design, performance and manufacture is the subject of a new brochure released by **Dow Corning Corporation.**

* * *

Titled "Extra Edge for Extra Sales," this 8-page, comprehensive report describes for the first time practically all known appliance uses for silicone rubber, paints, fluids, lubricants, and electrical insulation. Includes photos, graphs and tables to illustrate how silicones aid in providing long maintenance-free service by improving mechanical dependability and electrical reliability.

* * *

For a copy, write Dow Corning Corp., Midland, Mich.

Code: 1-116

Another Development ... by Hubbard!

PLYWOOD MARRIES STEEL

FOR BETTER SHOP REELS

RESULTING IN

1 GREATER IMPACT STRENGTH

2 LOWER MAINTENANCE COSTS

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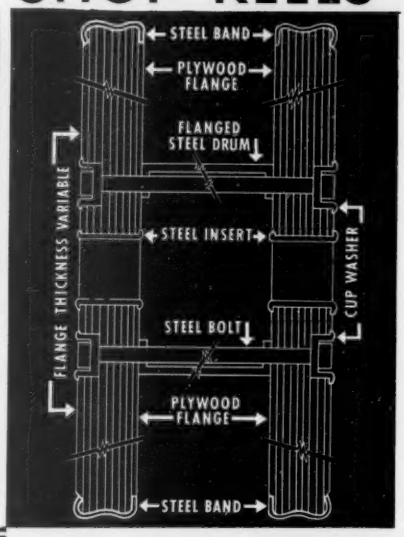
4 CAN BE SUBMERGED IN WATER

5 WIDE RANGE OF SIZES



LOWER INITIAL COST

FOR DETAILS CONTACT

HUBBARD SPOOL DIVISION

The American Pulley Company

GARRETT, INDIANA

A Review of Recent Wire Patents

The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication.

Complete copies of these patents may be obtained by writing to the publisher of this magazine and remitting 50c for each copy desired. For orders received from outside the United States the cost will be $1.00 per copy.

No. 2,939,207, REINFORCING WIRE, patented June 7, 1960 by Orville E. Adler, Niles, Mich., assignor to National Standard Company, a corporation of Delaware.

About the iron wire core is a corrosion-resistant coating of either tin, cadmium or zinc, a thin barrier coating on the corrosion-resisting coating of either antimony, nickel or cobalt, and a rubber-adherent metallic coating on the barrier coating of either copper or alloys thereof. Fifteen claims.

* * *

No. 2,939,360, BRAID ANCHORAGE STAND, patented June 7, 1960 by George T. Carten, Milford, Conn., assignor to Carten Redi-Braid, Incorporated, Devon, Conn., a corporation of Connecticut.

A stand is disclosed for holding newly-formed braid during continued carrying on of the braiding process, comprising a pyramidal group of three relatively swingable wire legs with a hinge block at the junction of the group of legs.

* * *

No. 2,940,480, MACHINE FOR BENDING PREFORMED SINUOUS WIRE, patented June 14, 1960 by Harry H. Fante, Riverside, and August T. Gonia, Berwyn, Ill., assignors to Rockwell-Standard Corporation, a corporation of Pennsylvania.

More specifically the machine is adapted to bend preformed zigzag wire sections into configurations for use in automotive vehicle seat or back cushions. This machine is related to that disclosed in U.S. patent 2,777,476.

* * *

No. 2,940,883, APPARATUS FOR HOT PRESTRESSING ARMORED CABLE, patented June 14, 1960 by Walter T. Peirce, Worcester, Mass., assignor to United States Steel Corporation, a corporation of New Jersey.

The cable relates to oil well logging cable and an electro-mechanical apparatus is disclosed whereby electric current is conducted through the armor wires of the cable to heat them while tensional forces are applied to the wires, permanent elongation will be removed therefrom so that the wires will not permanently elongate to any great extent under deep well operative conditions.

* * *

No. 2,941,348, MANUFACTURE OF WIRE STRANDS, BUNCHES, AND CABLES, patented June 21, 1960 by Jean Biche and Leon Andouart, Paris, France; said Biche assignor to Societe le Materiel de Cablerie, Courbevoie, France, a corporation of France.

For producing twisted wire strands from individual wires, the inventors provide an apparatus comprising dies for receiving fed-out wires and imparting a twist thereto, a device rotatable with the die means for applying a draft force to the strand, and a hollow coiler rotatable coaxially with the die means and receiving the strand therein to coil the strand over an inner peripheral surface of the hollow coiler.

* * *

No. 2,941,464, REVERSIBLE WIRE BINDING MACHINE, patented June 21, 1960 by Albert E. Cranston, Jr., P.O. Box 207, Oak Grove, Oreg.

There are fourteen claims to this patent for a rotatable wire laying device operable for an automatic binding operation.

* * *

No. 2,941,563, SLOTTED SCREW WITH UNTHREADED INTERMEDIATE LOCKING PORTION, patented June 21, 1960 by Minor F. H. Gouverneur II, Wheaton, Ill., assignor to Illinois Tool Works, Chicago, Ill., a corporation of Illinois.

A self-locking screw is provided having a partly slotted shank and a circumferentially-reduced non-screw threaded shank portion.

The PESCHEL line

ELECTRICAL TEST EQUIPMENT FOR THE Wire Industry

Low Cost-High Quality Sparker

Now- GUARANTEED FOR 5 YEARS

Model S14CV — AC/DC

FEATURES: RUGGED CONSTRUCTION WITH LONG LIFE SELENIUM RECTIFIERS • ACCURATE AT ANY SPEED • DC OR AC OUTPUT • FOR USE ON EXTRUDER OR RESPOOLER. ANY SPEED • 400 FPM WITH 1" ELECTRODE (2400 FPM WITH 6" ELECTRODE) • RELIABLE OPERATION DOWN TO 5% OF MAXIMUM OUTPUT VOLTAGE • SIMPLE TO OPERATE BY INEXPERIENCED PERSONNEL.

FOR BEST VALUE — SPECIFY PESCHEL SPARKERS

PE PESCHEL ELECTRONICS, INC.

TOWNERS, NEW YORK (Putnam County) Tel: TRinity 8-3251

No. 2,941,734, CONTROL FOR TOROIDAL COIL WINDING MACHINES, patented June 21, 1960 by William W. Clarke, Brookfield, Conn., assignor to Boesch Manufacturing Co., Inc., Danbury, Conn., a corporation of Connecticut.

Electro-mechanical means is provided for reversing the movement for winding the wire. There are eleven claims.

* * *

No. 2,941,743, WIRE FABRIC REELING MANDREL WITH ROTATABLY RETRACTABLE WINDING HOOKS, patented June 21, 1960 by Donald P. Cochrane, Brecksville, and Albert L. Stoeckel, Euclid, Ohio, assignors to United States Steel Corporation, a corporation of New Jersey.

Movable winding hooks are provided which alternately extend outwardly of a rotatable mandrel and then extend inwardly thereof for engagement, when projected to hook into the wire fabric for winding of the latter.

* * *

No. 2,941,746, MACHINE FOR REELING ELECTRIC CABLE, patented June 21, 1960 by James A. Hunt, Union, N.J., assignor to Joseph D. Dawkins, Garden City, N.Y.

There is provided a rotatable cable winding arm associated with the winding reel for guiding the cable onto, with level winding, and off the reel without twisting or disconnecting it from an electric circuit.

* * *

No. 2,942,269, BENDING TOOL, patented June 28, 1960 by Samuel Austin, 36 Colebrook St., Hartford 12, Conn.

This is a hand tool of the pliers type and adapted to wrap a wire clip about a bundle of wires. Fifteen claims.

* * *

No. 2,942,278, SPRING CUSHION ASSEMBLY EMPLOYING CYLINDRICAL SPRINGS, patented June 28, 1960 by Murray Jerome Rymland, c/o Comfort Spring Corp., Fairmount Ave. and Bethel St., Baltimore 31, Md.

The end convolutions of adjacent of the helical wire springs of the assembly overlap and are hingedly connected together.

* * *

No. 2,942,630, MACHINE FOR MANUFACTURING WIRE MESH, patented June 28, 1960 by Otto Schmid, Reutlingen, Germany, assignor to Wafios Maschinenfabrik Wagner, Ficker & Schmid, Reutlingen, Germany.

A elongated netting beam is provided with a longitudinal cutout containing a rack slidable therein associated with a cam having a figure 8-shaped cutout for movable connection with a crank extending through the cutout so that turning of the crank is transmitted through the cam and the machine car carriage to the rack for movement of the beam.

* * *

No. 2,942,793, MULTIPLE COIL WINDING MACHINES, patented June 28, 1960 by Harry W. Moore, 3710 Tangier Terrace, Sarasota, Fla.

The machine is adapted to wind wires simultaneously upon a core having a number of wire receiving slots, and includes a number of radially disposed non-parallel bores, the bores lying in a common plane and angularly disposed with respect to each other, with a shaft for each of the bores, a device mounted on the shafts for winding the coils on the core, and a device for driving all of the shafts in synchronism so that the coils are wound simultaneously.

Folder on Sunbeam's Automatic Casemaster

Sunbeam Equipment Corp., 180 Mercer St., Meadville, Pa., has issued a 6-page technical bulletin on its automatic Casemaster furnace for carburizing, carbonitriding, carbon restoration, normalizing, annealing, and hardening.

* * *

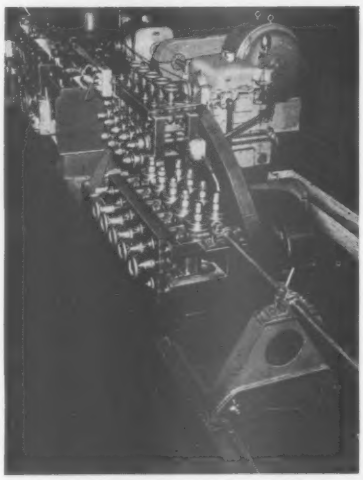
It is a controlled atmosphere furnace for heat treating small parts, bolts, nuts, hinge pins, screws, etc., with a high degree of production efficiency.

* * *

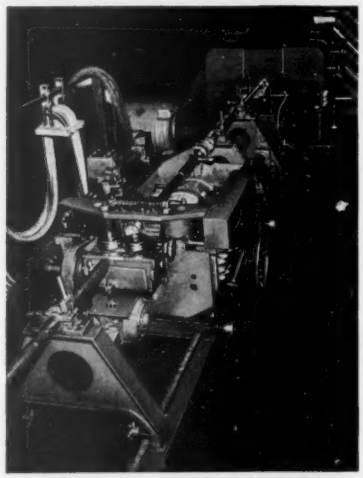
For a copy, write the company, asking for Bulletin Sec. -9.

LOMATIC

COMBINED DRAWING STRAIGHTENING CUTOFF AND POLISHING MACHINE



Payoff - Drawbench - Straightener



Flying Shear - Polisher - Discharge

Now available in two standard sizes, the revolutionary LOMATIC machines handle ferrous and non-ferrous rods and tubes at speeds up to 200 ft. per min. and with drawing capacities up to 16,000 lb. Compared to conventional separate rod drawing, straightening, polishing and cutting-to-length operations, the LOMA single-operation fully automatic machine offers the following major advantages:

- Greater output rate — continuous operation at high speed
- Reduced labor cost — only one operator required
- Improved straightness — stock is straightened in two planes
- Perfect concentricity — obtained by straight-line drawing action
- Higher surface finish — due to two-stage polishing unit

The complete line comprises an uncoiler, a pre-straightener, a drawbench, a roller straightener, a flying cutoff, a polishing machine and a discharge table. All components required for the complete sequence of processing operations are interlocked mechanically and electrically into one integrated and synchronized line which is controlled by only one operator.

Our standard line of equipment includes:

- Casting Machines and Molds
- Saws and Cut-off Machinery
- Hot and Cold Rolling Mills
- Rod and Tube Draw Benches
- Roller and Stretcher Levellers
- Air and Hydraulic Tube Testers

LOMA
MACHINE MFG. CO., INC.
114 East 32nd Street
New York 16, N. Y.

Wire Nails

(*Continued from Page* 1006)

conventional nail, provides five times the holding power and is less apt to creep back out of the joists.

* * *

A cost comparison of bright low-carbon-steel versus same-length hardened high-carbon-steel nails and spikes is given in the following table. Use of the slimmer hardened nails can result in such material savings that the lighter hardened nail is actually more economical if longer than 4 inches, despite the added cost of material and processing.

* * *

TABLE I

Bright Low-Carbon-Steel Versus Hardened High-Carbon-Steel Nails and Spikes

Length of Fastener	Wire Diameter of Fastener		Count Per Pound		Cost Per 100 Pounds		Cost Per Fastener	
	Bright	Hardened	Bright	Hardened	Bright	Hardened	Bright	Hardened
2" (6d)	0.113"	0.105"	167 (100%)	190 (114%)	100%	135%	100%	116%
2½" (8d)	0.135"	0.120"	95 (100%)	117 (123%)	100%	135%	100%	109%
3" (10d)	0.148"	0.135"	66 (100%)	78 (118%)	100%	132%	100%	112%
3¼" (12d)	0.148"	0.135"	60 (100%)	73 (122%)	100%	132%	100%	108%
3½" (16d)	0.165"	0.148"	49 (100%)	57 (116%)	100%	135%	100%	115%
4" (20d)	0.203"	0.177"	31 (100%)	36 (116%)	100%	135%	100%	116%
4½" (30d)	0.207"	0.177"	22 (100%)	32 (145%)	100%	127%	100%	88%
5" (40d)	0.225"	0.177"	18 (100%)	27 (150%)	100%	127%	100%	85%
5½" (50d)	0.238"	0.177"	14 (100%)	23 (164%)	100%	127%	100%	78%
6" (60d)	0.262"	0.177"	10.8 (100%)	18 (167%)	100%	127%	100%	76%
7"	0.312"	0.207"	6.4 (100%)	15.4 (240%)	100%	126%	100%	82%
8"	0.375"	0.207"	5.0 (100%)	13.0 (260%)	100%	124%	100%	48%
9"	0.375"	0.218"	3.4 (100%)	10.5 (309%)	100%	124%	100%	41%

The estimated 1250 carloads of threaded nails manufactured in the U.S.A. per year are used for a great variety of wood assemblies, for fastening ladies shoe heels and for the assembly of wooden pallets, for assembling all-nailed trussed rafters and for fastening subflooring, underlayment, strip flooring, gypsumboard, siding, roofing, fencing, etc. (Fig. J).

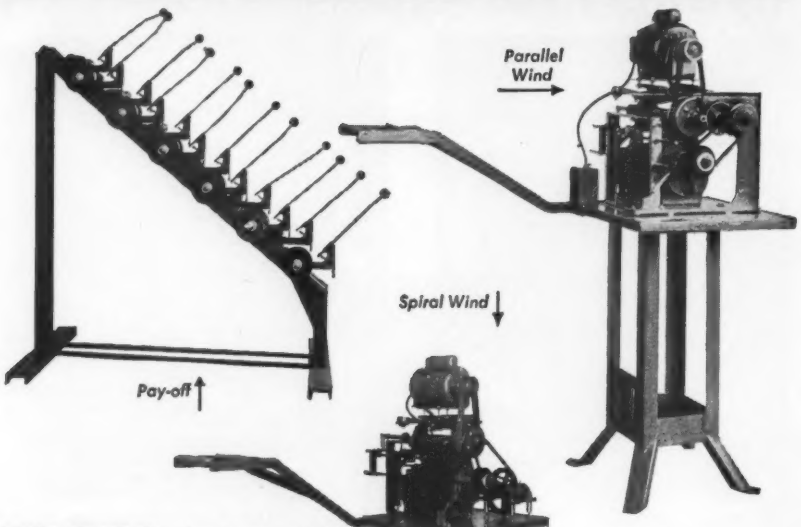
* * *

Threaded nails have made a place for themselves. The demand for them is increasing more and more as users discover their great performance. As with many successful new items, there is and will be a shortage of threaded nails,

Fig. J. — As many as 50,000 to 100,000 nails are driven during the construction of every frame house.

since the demand is increasing more rapidly than the supply. Imitations from foreign countries have already reached a large volume. As long as domestic manufacturers maintain, however, higher quality, greater diversity, and superior

STANDARD UNI-DRIVE WIRE WINDER



WIRE WINDER Our New Uni-Drive Wire Winder is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel — no over or under-winding. Can also be furnished with a slight spiral pattern for winding exceedingly fine wire. Automatic Stop Motion controls each strand. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors.

Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.

PAY-OFF Our Pay-off Attachment consists of a heavy fabricated frame on which Pay-off spools are mounted to cover desired number of ends to be wound. Equipped with spindles, running on self-aligning ball bearings, with size of spindles and adapters to accommodate customers' pay-off spool. Compensating Attachment to control the tension of each individual strand of wire, applying the same tension when spool is full as when empty. Can also be adapted for use with bunching machines.

STANDARD MILL SUPPLY COMPANY
31 ESTEN AVENUE PAWTUCKET, R. I., U. S. A.

Fig. K. — The figurative nail head (left) is a reminder of a European stone figure (right), showing a hard-working artisan on the job.

technical understanding of nails and nailed structures, the United States can retain their leadership. Be it remembered that in a little over a quarter of a century, an estimated 10,000 sizes and varities of threaded nails have been developed in this country, with every one of them engineered to excel in a specific job!

* * *

Credit is due to the **Independent Nail & Packing Company,** the largest manufacturer of threaded nails in the world, who sponsored much of the research and development work performed in the VPI Wood Research Laboratory and, thus, has made an outstanding contribution to progress in the field of fastening.

Booklet On Photomicrography

A new "how-to" book, "Photomicrography of Metals," a reference guide for metallurgists, has been published by **Eastman Kodak Company.**

* * *

The 46-page data book may also serve as a short course in photomicrography for those metallurgists interested in reviewing the latest techniques in this field. In addition, the booklet should prove a valuable addition to metal industry technical libraries.

* * *

It is illustrated with photographs, charts and graphs. Written in layman's language, the booklet contains six major sections which include detailed information on the metallographic microscope, illumination, filters in metallography, photographic materials, exposure determination, and processing and printing.

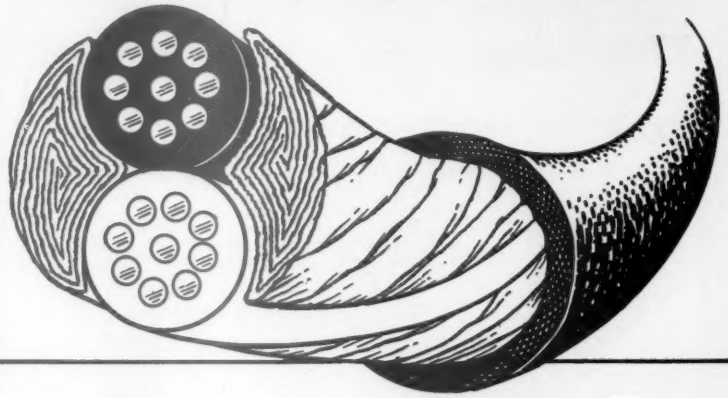
* * *

Available through many Kodak dealers, the booklet is priced at 50 cents. The booklet may be also ordered directly from Sales Service Division, Eastman Kodak Company, Rochester 4, N. Y., for 50 cents plus 10 cents for handling.

Flat Ribbon Cable

Spectra-Strip Wire & Cable Corporation has introduced a new idea in wiring, flat bonded cable. Many advantages are claimed for this new style of cable, among them flexibility, ease of handling, full visibility of the color code, control

INSIDE STORY ON
FLEXIBLE CORDS



If you are not realizing a desired profit in your manufacture of flexible cords, why not consider Plymouth S.J. (Sisal) Filler for these reasons:

STRENGTH: Provides ample tensile strength to meet U.L. tests for 18-16-14 gauge, S, SJ, SV, SJT, SVT cords. Comes in 4 sizes.

FLEXIBILITY: S.J. Cable Filler will not stiffen cord in *any* way.

GREATER FILL CAPACITY: Plymouth's special S-Z twist (opposing twists) makes finished cord uniformly round, with no ridges, bumps or convolutions.

CLEAN STRIPPING: S. J. Cable Filler allows cleaner, faster cutting of finished product in Cord Set department . . . no ragged filler ends.

ECONOMY: The end result of all these advantages. Plymouth S.J. Cable Filler has been proven by several of the largest flexible cord manufacturers to be the most economical filler ever used.

Call or write any office below. We will be glad to consult with you on your cable filler problems.

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PLYMKRAFT DIVISION
Plymouth Cordage Company, Plymouth, Massachusetts

of inter-conductor capacitance, uniformity between one length of cable and the next, or between one harness and the next. Improved signal to noise ratio can be obtained with the Spectra-Strip method of shielding (grounding the wire on one or both sides of the involved conductor), and at lower cost than braided shield. Savings in weight and space are claimed, and also better heat dissipation. Gauges from 10 AWG to 30 AWG. Shielded wires, Coaxial leads, or Thermocouples can be included.

* * *

Write to **John Ford,** Spectra-Strip Wire & Cable Corporation, P. O. Box 415, Garden Grove, Calif.

Future of Copper Production

"Considering the imbalance between the world's supply of copper and demand, the domestic price of 33 cents a pound has been living on borrowed time," **Dr. Joseph Zimmerman,** metals industry authority, told wire and cable company executives in April at the closing session of their 3-day annual meeting at Westchester Country Club. The meeting was sponsored by the Wire and Cable Division of the **National Electrical Manufacturers Association.**

* * *

Dr. Zimmerman, editor-in-chief of the Daily Metal Reporter, credited foreign consumers of copper with helping to maintain the favorable price, saying that they have bought "prompt copper" heavily in the domestic market "as insurance against a possible strike in Chile or against labor disturbances in the copperbelt in Rhodesia or in the Belgian Congo."

* * *

He said that had it not been for the recent large exportation of copper from the United States, the price here probably would have been lower by now.

* * *

As to the future, he stated that barring any involuntary interruption in production through strikes or work stoppages, this year's world production gives every indication of running in excess of consumption, and it remains to be seen whether the world's leading producers will profit by their former experiences. In the past when cutbacks were finally resorted to in an effort to restore price stability, it frequently turned out to be a case of too little and too late.

* * *

Domestic consuming demand for copper is being held back not only by the disappointing volume of business from the ultimate consumers of fabricated products, but also by the lack of confidence in the market's stability. It is up to producers to restore that confidence.

* * *

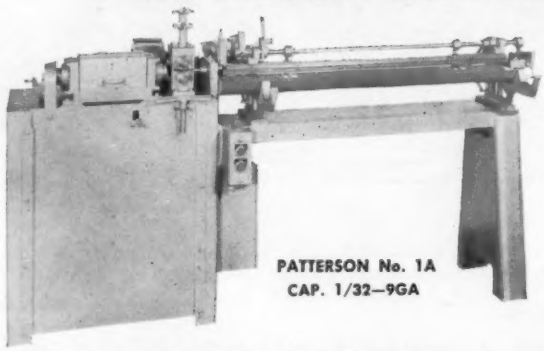
The outlook for world copper consumption for the balance of the year is promising. An increase of 10% in domestic consumption this year over 1959 seems likely.

Metal Show in Philadelphia

The 1960 Metal Show (42nd National Metal Congress and Exposition) will be held in Philadelphia, Pa., Oct. 17-21. Headquarters of the **American Society for Metals** will be The Bellevue-Stratford Hotel and the Metal Show will be in the Convention Hall. Information may be secured from **Allan R. Putnam,** Managing Director of ASM, Metals Park, Novelty, Ohio.

GEO. C. PATTERSON
HI-SPEED
AUTOMATIC WIRE STRAIGHTENING & CUT-OFF MACHINES

ELECTRICALLY OPERATED
with VARIABLE SPEED DRIVE



PATTERSON No. 1A
CAP. 1/32—9GA

We are proud to present this machine & 35 additional models to the mills and fabricators of wire, for we honestly believe they are top value in their field today. We have spared no expense to give you a precision machine tool that will give years of uninterrupted service. All iron castings are close grained Meehanite iron; cut-off and opener levers are high grade steel castings; all guides are hardened tool steel; electrical equipment is wired ready to run.

- MINIMUM COST
- MAXIMUM PRODUCTION
- ACCURATE LENGTHS
- NEW FEATURES

WRITE FOR FREE LITERATURE ON YOUR REQUIREMENTS

The GEO. C. PATTERSON Machine Company

3409 TRUMBULL ST. CLEVELAND 15, OHIO
PHONE: BRoadway 1-1808

New Fine Wire Plant to be Built

Fort Wayne Metals, Inc., producer of precision stainless alloy wires, has announced plans for the construction of a new and larger plant.

* * *

Ardelle Glaze, president of the Fort Wayne firm, described the new plant as the "most modern of its type in the western world."

Fort Wayne Metals New Plant. * * * *

Planned for a total size of about 90,000 square feet by 1965, construction on the first 30,000 square foot "module" of the new plant will begin this summer and will be in operation about mid 1961.

* * *

Fort Wayne Metals is a pioneer in the development of special alloys for magnetic electronic and mechanical applications. Mr. Glaze personally developed the use of stainless steel wire for wire recorders and for radio frequency shielding purposes and the company now is the largest producer of recording wire.

* * *

The company's plant and engineering requirements are said to be the most stringent in the wire drawing industry. The firm produces wire so fine that it would take four strands laid side by side to equal the size of a single human hair. A one-pound spool of this wire would stretch well over 100 miles. One man could lift enough to girdle the earth.

* * *

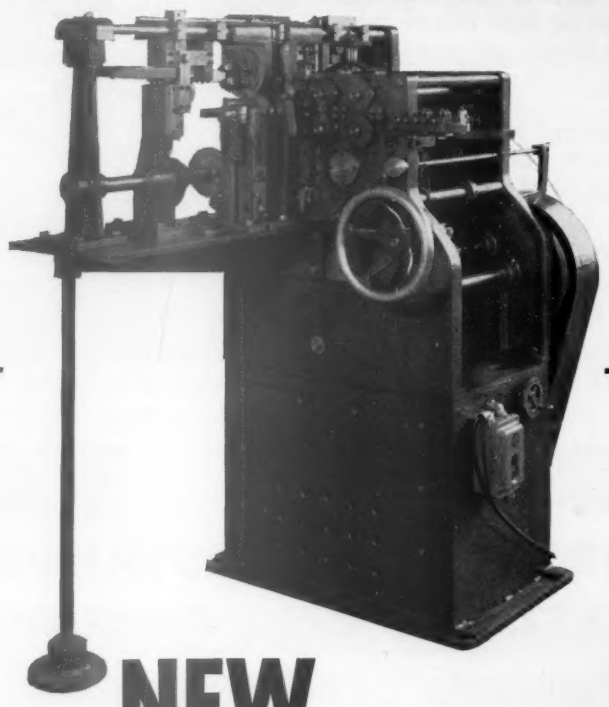
Working to such ultra small sizes, Fort Wayne Metals must maintain laboratory conditions in the plant. Much effort is devoted to basic research and development.

* * *

Mr. Glaze, formerly a research scientist for the Armour Research Foundation, started his business in 1946 when he took over a small wooden building at the firm's present site. In the 13 years following its inception, the physical plant grew to its present 12,000 square feet; sales increases of 77% in 1959 makes this expansion imperative.

New Reinforced Teflon

Wire insulation made from a new type of fluorocarbon resin (Teflon) offers improved resistance to abrasion, plastic flow, cut-through and heat. This extension of standard Teflon properties has come about through a special process developed



NEW For Springmakers

AUTOMATIC COILER and LOOPER

WELLS' NEW FULLY AUTOMATIC SPRING COILING AND LOOPING MACHINE coils, trims and loops in sequence. By trimming before looping extremely accurate springs are made. Produces cross-over, machine and side loops, or any combination of these.

Machine shown above handles .025" to .062" diameter wire, forming coils of 3/16" o.d. to 5/8" o.d., 1/2" to 5" long.

Loops on each end can be varied 360° to each other and held to ±3°. Loop openings can be held to ±.010", or less.

Adapted from the WELLS large diameter automatic coiling and looping machines made for several years, this new spring machine will be a boom to manufacturers of mechanical coil springs.

Made By The Producers of the Wells Straightening And Cutting Machines.

Write for information

Frank L. Wells Company

BUILDERS OF FINE WIREWORKING MACHINERY

5821 FIFTH AVENUE • KENOSHA, WISCONSIN

QR — HARVEY SPRING MFG. CO. — 671 N. Sangamon St., Chicago, Ill.

by **W. L. Gore & Associates, Inc.,** Newark Delaware.

* * *

Basically, the process for making Type AR insulation, as it's called, consists of adding mineral-fiber particles to Teflon — the particles averaging about 1 micron in diameter and 500 to 1000 microns in length. More than 90 percent of the fibers lie parallel to the wire surface.

* * *

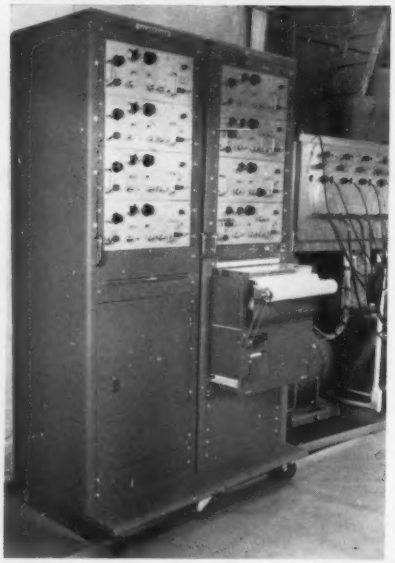
Type AR insulation is available in the form of Mono-Tet AR single-conductor wire, Multi-Tet AR multiple-conductor flat ribbon cable, and in shielded and coaxial conductors.

* * *

For additional information, write W. L. Gore & Associates, Inc., 487 Paper Mill Road, Newark, Del.

Extruder Pressure and Temperature Totally Instrumented*

The Davis-Standard Extrusion Laboratory now is equipped with an eight-channel continuous strip-chart recorder. The extrusion equipment is outfitted with temperature sensing devices, and pressure transducers. All data points on the extruder terminate at a junction box from which any group of 8 variables can be readily connected to the recording instruments for study.



Davis-Standard Extrusion Recorder.

* * *

The research instrumentation includes:

Extruder cylinder pressure transducers.
Die or head pressure transducer.
Extruder cylinder temperature control and recording from either shallow or deep thermocouple positions in each zone.
Unshielded thermocouple for melt temperature.
Screw rpm tachometer, indicating or recording.
Drive motor amperage, indicating or recording.
Marker signal, indicating each full rotation of the screw.

The value of this instrumentation and the data recorded will be reflected in the advancement of screw design and other factors leading to uniformity of output. Davis-Standard is in a position to study all factors that may affect extrusion output or quality.

* * *

Instrumentation is now in use on a 2½" bore 20:1 L/D thermatic The Extrusion Laboratory is set up to handle Wire Insulating,

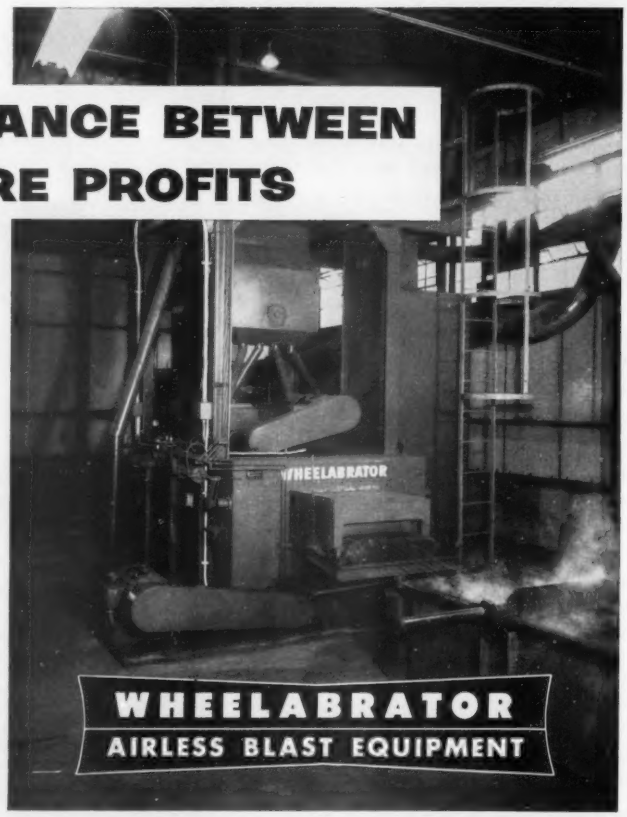
EXECUTIVE REPORT #25

THE SHORTEST DISTANCE BETWEEN STEEL ROD AND WIRE PROFITS

Wheelabrator® Straight-Line Cleaning, Patenting, Coating

At Leschen Wire Rope Division of H. K. Porter Co., Inc., 12 strands of hot-rolled rod go simultaneously through patenting, cleaning and coating in one continuous operation. Wheelabrator mechanical blast descaling is the essential step that makes this efficient processing possible. The blast descaling process eliminates the problems associated with acid pickling, and makes additional savings in time and labor costs.

This efficient production line operates continuously for 24 hours a day, 5 days a week without down time. Investigate the benefits you can realize with this new process for cleaning any type of ferrous or non-ferrous hot rolled rod and bar stock for cold drawn products. Write to Wheelabrator Corp., 389 S. Byrkit St., Mishawaka. Ind. In Canada, P. O. Box 490, Scarborough, Ont.



Blown Film, Sheeting, Shape and other types of extrusion.

* * *

The installation of the Pressure and Temperature Totally Instrumented Extruder gives Davis-Standard a distinct advantage in Research and Development, leading to the engineering of the most advanced, highly productive extrusion systems.

---

*With acknowledgment to the work of all major chemical laboratories and especially to the achievements of Dr. E. C. Bernhardt of E. I. DuPont De Nemours & Co. and Bruce Maddock of Union Carbide Chemical Co.

New Put-Up For Fine Wire

Stamford Processing Co., Buchanan, N. Y., reports success with fine sliver plated copper wound on Stamco Service Reel #40.

* * *

Providing 40 lbs. net weight in continuous lengths in sizes #34, #36 and #38 AWG was the result of a survey of customers' needs, particularly those who want high speed pay-off with stop and start features.

The #40 Service reel is a conventional 8x6x3 steel or aluminum reel with a straight barrel. Its compact size and rugged construction makes it ideal for use with all types of "bucket" pay-off equipment. The large barrel leaves proper distance to the flange top so the wire unwinds clean to the barrel at top or slow speeds.

* * *

Highly polished rolled flanges on the reel make it possible to eliminate the trouble of caps, rings and other gadgets which have been used for years to overcome nicks, dents or burrs on the flanges.

* * *

Customers' inventories are kept at a suitable level for silver plated copper by standardizing on a 40 pound package. Enough reels can be kept for all types of shielding work without tying up tonnage and without running short by having too much on one package.

* * *

Elongation is maintained by tension control in winding and a special driving design permits Stamco to maintain constant speed without affecting this tension. Six spoolers have been added and six more soon are to be installed.

* * *

In addition to silver plated copper, Stamford Processing also manufactures fine copper, high conductivity alloys, tinned copper as well as metallizing wires, zinc and cadmium, and fine wire specialty items.

Method To Check Screw Thread Pitch Diameter

Text books & standards publications recommend the 3-wire method for a true measurement of pitch diameter as a single element.

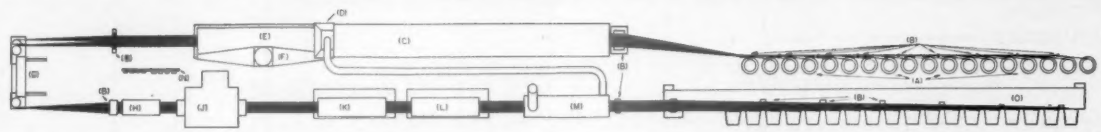
* * *

The O-Vee gage together with any standard hand micrometer enables the user to determine the actual size of a screw thread and whether it is within tolerance, without any reference to table or calculations.

* * *

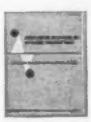
EXECUTIVE REPORT #26

WHEELABRATOR® TAKES THE KINKS OUT OF WIRE MANUFACTURING



A. PAY-OFF SWIFTS
B. ROD GUIDES
C. FURNACE
D. COLLECTING HOOD
E. LEAD BATH
F. EXHAUST HOOD
G. TURN AROUND
H. WATER COOLING BATH
J. WHEELABRATOR MACHINE
K. BORAX COATING BATH
L. LIME COATING BATH
M. DRYER
N. CONTROL PANEL
O. TAKE-UP FRAME

One of the newest and most modern wire products manufacturing plants in operation is that of John A. Roebling's Sons Corp. Here, 18 strands of steel wire pass simultaneously through the muffle furnace, load quenching bath, Wheelabrator mechanical blast cleaning machine, coating baths, drying ovens, and recoil spools on the take-up frame. All this, in an area only 250 ft. long by 30 ft. wide. Production rate is about 6,000 lbs. per hour. Wheelabrator airless blast cleaning makes this efficient, "straight-line" production possible, minimizes handling costs, solves the acid-disposal and equipment-maintenance problems.



SEE HOW OTHERS have saved with Wheelabrator automated production methods. For Bulletin 148-D write to Wheelabrator Corp., 389 S. Byrkit St., Mishawaka, Ind. In Canada, P. O. Box 490, Scarborough, Ont.

WHEELABRATOR
AIRLESS BLAST EQUIPMENT

This new measuring gage consists of a coil spring mounted on a data plate. Inserting the gage on the thread is done by depressing the lever thus expanding the coil. Measurements are taken with an ordinary micrometer over the coils and then checked with limits printed on data plate. No calculations or tables are required. The O-Vee gages come either in single units or in sets.

* * *

For complete illustrated folder and price list, write to Scherr-Tumico, 200 Lafayette Street, New York 12, N. Y.

Making Good Ads

The Advertising Federation of America, 250 West 57th St., New York 19, N. Y., has published a book called "The Advertising Truth Book," written by The Association's Associate general counselor, Morton J. Simoa.

* * *

In it seven general rules are set forth:

1. **Advertisements must be considered in their entirety, and as they would read by those to whom they appeal.**
2. **Advertisements are not intended to be carefully dissected with a dictionary at hand, but rather to produce an impression upon the ordinary purchaser.**
3. **Advertisements as a whole may be completely misleading although every sentence separately considered is literally true. This may be because things are omitted that should be said, or because advertisements are composed or purposefully printed in such a way as to mislead.**
4. **Whether or not the advertiser knows the representations to be false, the deception of purchasers and the diversion of trade from competitors is the same.**
5. **A deliberate effort to deceive is not necessary to make out a case of using unfair methods of competition or unfair or deceptive acts or practices.**
6. **Laws are made to protect the trusting as well as the suspicious.**
7. **Advertising representations, however made, which are ambiguous will be read favorably to the accomplishment of the purpose of the Federal Trade Commission Act, which is to prevent the making of claims which have the tendency and capacity to mislead.**

* * *

In considering an ad, it is suggested that the advertiser or agency ask themselves: Is it really honest? Is it clear to those who read it? Can I prove all this? Would I approve if any competitor used this copy? Is this straight talk? Have I cut out all weaseling?

* * *

If the answer to all these is a positive "Yes" then the ad is pretty sure to be legal, truthful, meaningful, clear and likely to be productive.

* * *

While written primarily as a guide to the preparation of consumer ads, the principles will apply equally well to industrial advertising.

Aluminum Chain Link Fencing Being Tried Out

A new line of aluminum chain link fencing made of Reynolds aluminum and designed especially for residential use is being test marketed in seven cities by Anchor Post Products Company, Baltimore, Md.

* * *

COPPER - Consumption of refined copper in the United States, in February-March 1960, in short tons

	Wire mills 1/	Brass mills 2/	Chemical plants	Secondary copper smelters	Foundries and miscellaneous	Total
February:						
Cathodes	------	5,850	(3)	92	(3)	5,942
Wire bars	71,224	4,223	(3)	---	(3)	75,447
Ingots and ingot bars	1,510	10,407	(3)	112	(3)	12,029
Cakes and slabs	------	11,579	(3)	2	(3)	11,581
Billets	------	11,747	(3)	---	(3)	11,747
Other	78	------	(3)	37	(3)	115
Total	72,812	43,806	(4)	243	(4)	4/118,861
March:						
Cathodes	------	5,978	(3)	88	(3)	6,066
Wire bars	86,392	5,061	(3)	---	(3)	91,453
Ingots and ingot bars	1,472	9,616	(3)	239	(3)	11,327
Cakes and slabs	------	12,844	(3)	3	(3)	12,847
Billets	------	11,383	(3)	---	(3)	11,383
Other	91	------	(3)	30	(3)	121
Total	87,955	44,882	(4)	360	(4)	4/135,197

1/ Includes all wire mills with rod-rolling facilities. 2/ Includes all brass mills using copper in refinery shapes; some have rod-rolling facilities. 3/ Not available. 4/ Consumption by chemical plants, foundries, and miscellaneous plants not included. Estimate of 2,000 tons included in total.

Boston, Mass., Albany and Buffalo, N. Y., Richmond and Norfolk, Va., Atlanta, Ga., and Washington, D. C., were selected as the test cities, according to **C. W. Burton,** president of Anchor Post Products and **J. R. Quinn,** director of architectural and construction sales for **Reynolds Metals Company.**

* * *

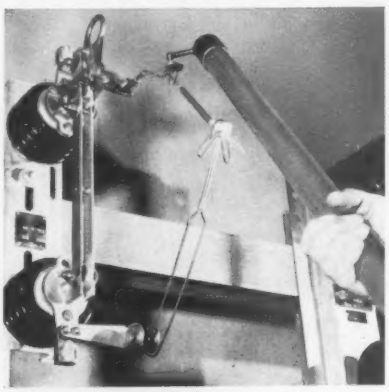
The new chain link fence line will be the first residential fence made of aluminum ever sold by Anchor, a major producer of metal chain link fence for over 68 years. Every component of the fence will be made of aluminum.

Copperply Wire Used For Cutout Springs

To provide protection against shorting in rural power lines, the **James R. Kearny Corp.,** St Louis, Mo., has developed a "Trip-O-Link" open-type fuse cut out for the protection of rural power lines.

* * *

For this the company is using Copperply wire made by National-



Hook stick places fuse link between upper and lower Copperply contact arms of Kearny 7.5 kv fused switch. * * * * *

Standard Company to form into the upper and lower contact arms. These cutout springs conduct current to and from the fusable element that protects the circuit, provide 30 to 40 lb. pressure to assure good electrical contact, load the fusable link with a 5 to 10 lb. tension to separate fuse ends when fuse melts, and absorb mechanical energy generated in the fuse when the circuit is interrupted, thus isolating the ceramic insulator from mechanical shock.

* * *

The Trip-O-Link is available in various size ranges for the voltages carried in conductor lines.

To Distribute Armco Stainless Wire

Central Steel and Wire Company, Chicago, Ill., announces they are now stocking a complete range of sizes of Armco 17-4 PH stainless steel bars and wire.

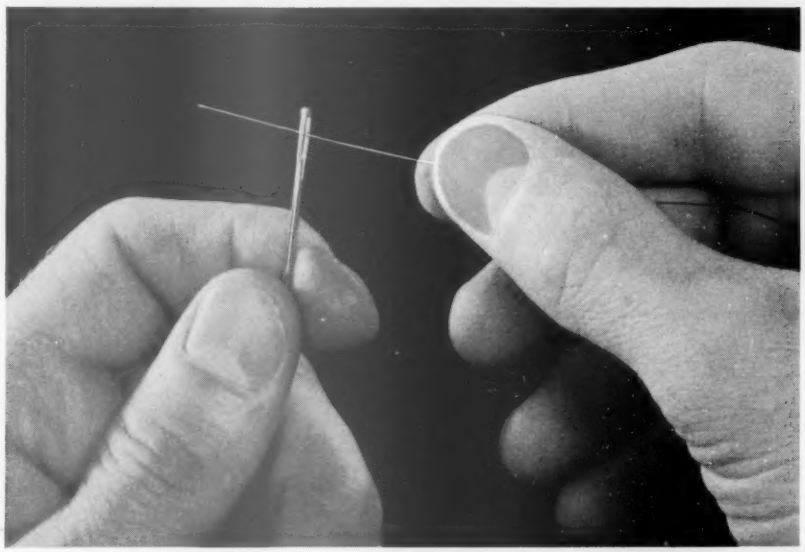
* * *

Armco 17-4 PH stainless steel provides a combination of properties important to many users and in many industrial products. It has corrosion resistance comparable to Type 302 Stainless Steel, good wear resistance (Rc 40-43), and high strength (up to 200,000 psi.). Properties are developed by a single low-temperature heat treatment with no scaling or distortion.

* * *

Central Steel and Wire serves the entire Midwest, with service centers in Chicago, Detroit, Cincinnati, and Milwaukee, and sales of-

METAL ALLOY WIRES:
Tailor-made for Specific Purposes



Precision Drawn **Single Strand** Wires

THESE BASIC ADVANTAGES ARE BIG ONES:—

- Closer in tolerances than most commercial wires
- Make important savings in finished products possible
- Tailor-made with special characteristics to meet specific functional needs

Drawing specialty wires to consistent hairline caliper with specific characteristics of strength, elasticity, hardness, resiliency or what have you . . . demands exacting *die control* through all production phases. When applied to specific requirements, these "Specials" also require extensive know-how experience and advanced production facilities.

As a leading producer of finest quality paper mill wire cloth, woven mesh and drawn single strands, our production team of metalurgists, engineers and technicians can help you select the right wires for any application and deliver them "on schedule."

WISCONSIN WIRE WORKS
APPLETON · WISCONSIN

fices in many other Midwestern cities. The stock of Armco 17-4 PH includes 20 sizes of round bars and wire, from ¼-inch to 3½-inch diameter, centerless ground finish.

1959 ASTM Proceedings Published

The American Society for Testing Materials announces the publication of its 1959 ASTM Proceedings, Vol. 59. This 1424-page volume records the technical accomplishments of the year, including reports and papers, together with discussions, offered to the Society during the year and accepted for the Proceedings. The volume includes the Summary of Proceedings on the ASTM 62nd Annual Meeting, June 1959, and the Summary of Proceedings of the Third Pacific Area National Meeting, September 1959, listing by title and author the programs for each session.

* * *

There are 71 reports of technical committees which, together with appendices, provide a wealth of useful information, as do the 44 technical papers and discussions on a wide variety of subjects pertaining to research and standards for materials. An important part of the Proceedings are the discussions not previously published which add immeasurably to the value of the technical papers.

* * *

Copies of the Proceedings may be obtained from the American Society for Testing Materials at $12.00 each at 1916 Race St., Philadelphia 3, Pa.

Tentative Definitions of Electrical Terms Formulated by ASTM

These definitions provide terminology and definitions of basic terms relating to electrical insulating materials. The definitions have been coordinated with those proposed by Sectional Committee C-42 on Definitions of Electrical Terms.

New Compressor Catalog

Allis-Chalmers is now making available what is said to be the most complete catalog ever offered covering performance and engineering data on its scroll casing design single-stage centrifugal compressors for air applications.

* * *

The loose-leaf catalog includes formulas for sizing the firm's B, C, and D style units, dimensional data and prices, and 123 performance curves.

* * *

Copies of the catalog can be obtained by request on company letterhead from Allis-Chalmers, Milwaukee 1, Wis.

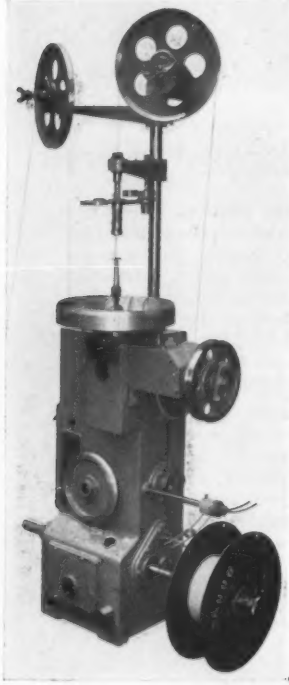
Directory of Electronic Industry Personnel

The Scientist and Engineer Technological Institute announces the publication, in the fall of 1960, of a Who's Who Directory in the Electronic Industry.

* * *

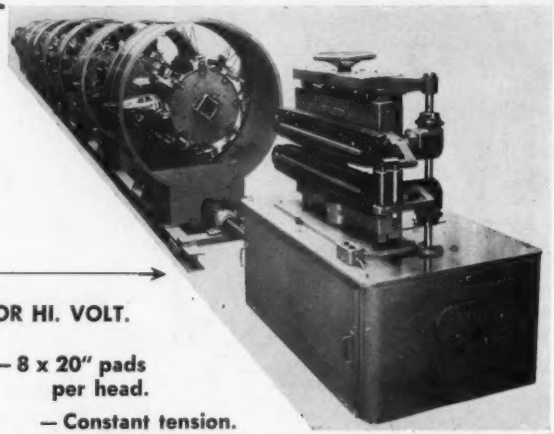
New . . .

IN PAPER LAPPING



FOR TELEPHONE

- High speed paper lapping.
- 3,000 r.p.m.
- Movable drum.
- Automatic stop.
- 12" pad.
- Electric counter.
- Central lubrication.



FOR HI. VOLT.

- 8 x 20" pads per head.
- Constant tension.
- Extensible pad centre.
- Individually braked.
- Variable die.
- Caterpillar haul-off.
- P.I.V. drive.
- Automatic stop.

POURTIER MACHINES

76 to 82 rue de la Fraternite

ROMAINVILLE (Seine) FRANCE

Scientists and Engineers on all levels will be included. As well, Sales, Marketing, Personnel, Industrial Relations, Financial, Legal, Purchasing, Technical Writing, Manufacturing, Market Research and Promotion Executives will be recognized.

* * *

Applications for inclusion should be sent to the Scientist and Engineer Technological Institute, Box #370, New York 21, N. Y. Selection of biographies will be made at the discretion of the editorial board.

New Tensolite Catalog

Tensolite Insulated Wire Co, Inc., Tarrytown, N. Y., announces the publication of a new product catalog containing engineering information on its wire and cable. A new self-reading code numbering system is employed which simplifies the identification of insulated wire and cable constructions. Copies are available upon request.

* * *

The company also has secured approval of Underwriters' Laboratories on its Teflon® insulated silver or nickel plated wire using solid or stranded conductors. These wires are gaining wide acceptance as wiring for computers and business machines.

Symposium on Electroless Nickel Plating

This symposium is an attempt to gather all of the known usefull information about "electroless nickel" plating together under one cover. The need for this publication became evident a few years ago when a task group under ASTM Committee B-8 on Electrodeposited Metallic Coatings investigated the desirability of publishing a specification on "electroless nickel" plating. It was apparent that a survey of the current status and knowledge in this field would have to be made before serious work on specifications could be attempted.

* * *

The information collected by the group evoked such interest that it was decided to make it available for both technicians and scientists in the field. This information should be of particular value to those who are not yet acquainted with this process, its advantages, and production problems.

* * *

Copies of this book may be obtained from ASTM Headquarters, 1916 Race St., Philadelphia 3, Pa. at $2.50 each.

A Bit of Cleaning History

In the early days of wire, rods and annealed wire were freed from scale by rubbing them with stones or bricks and sand. This practice was followed for some 500 years.

* * *

This hand cleaning was slowly superceded by "thrashing", in which the scale was cracked off by rollers followed by tumbling in a barrel of water and sand.

* * *

The idea of pickling came very slowly, for while the action of acids on metal was known, acids were considered too expensive. For a hundred years before pickling came into general use, it is recorded that wire was soaked in waste products containing organic acids. Liquors from the distillation of wood, fermented rye meal, brewers' wastes, tartar from wine vats, and similar materials are mentioned in early writings. Some of these were so slow in action, that it took a month to soften the scale sufficiently so that hand thrashing could complete the job. But the wire was smooth.

* * *

Pickling sheet iron began in 1806, although the process was considered too costly for wire. In the period of 1855 to 1865 acid pickling of wire came with a rush, spurred by the need for long lengths of wire for the telegraph companies. Whereas 10 pound rod bundles had been standard, the new cleaning technique enabled wire mills to increase rod coil weights to 50 pounds.

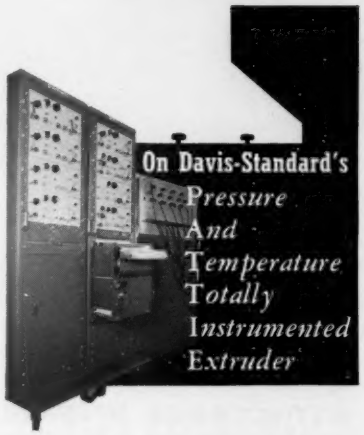
* * *

In the last hundred years since pickling became general, vast strides have been made — big rod bundles, better pickling technique with inhibitors, mechanical descaling, electrolytic descaling, etc. — and the chemical and metallurgical aspects are fairly well understood, albeit the theory of hydrogen embrittlement still is a moot question.

Complete

EXTRUSION DATA

Recordings



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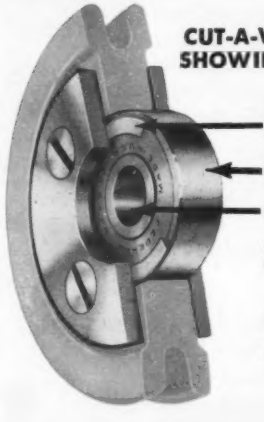

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Automatic Test Equipment for Communication Cable

(*Continued from Page* 996)

When an unknown resistance is connected through the relay switching system to the bridge, the resultant output signal is inverted into a phase reversible 60 cycle voltage and amplified to drive a two-phase servo motor. The motor in turn, thru gearing, rotates the measuring standard to restore the bridge balance. A reference voltage network, also geared to the motor, transmits a signal proportional to the angular displacement of the standard to the readout device which prints the characteristics value. The bridge has a range of up to 300 ohms/mile, which covers the measurement of 10 A.W.G. through 26 A.W.G. copper wires. The required accuracy of the test is ±1 percent of the reading.

Capacitance Unbalance Bridge

The capacitance configuration outlined by dashes in Figure 4, and those of similar cable conductor arrangements, are measured with a 900 cycle capacitance unbalance bridge. One pair of conductors is connected through the relay switching system, one wire each, to two opposing corners of the bridge; a second pair to the other two opposing corners. The distributed capacitances between the conductor of each pair shunt the power supply or detector, and therefore do not affect the capacitance unbalance. The distributed capacitances between conductors of one pair, and those of the other, separately shunt the four arms of the bridge. By definition, the resultant unbalance:

$$CU = (C_{AB}+C_{CD}) - (C_{BC}+C_{AD})$$

* * *

The error signal from the bridge is fed through a limiter network to a mixer network and combined with a properly phased 900 cycle reference voltage. The resultant signal is then fed to a phase detector where it is rectified and compared to a rectified 900 cycle reference voltage. The output of the phase detector network is then inverted by a synchronous chopper into a phase reversible 60 cycle voltage, and amplified to drive a

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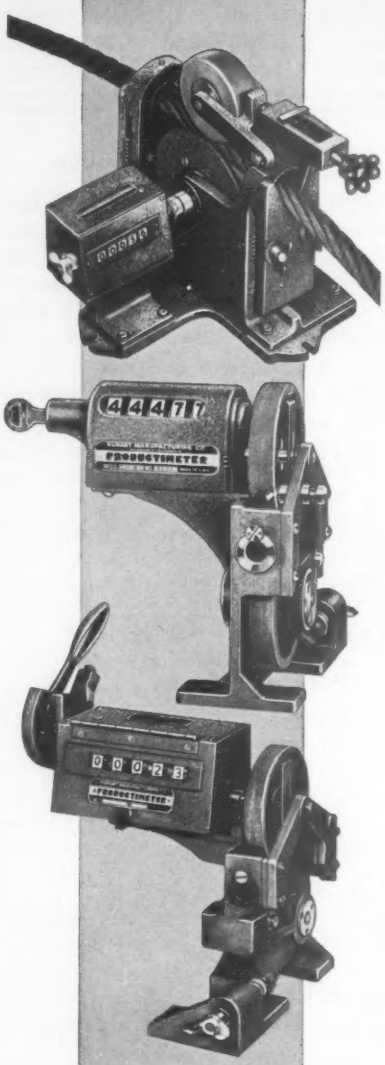

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two phase servo motor.

* * *

The measuring standard, which is rotated by the motor to balance the bridge, is a single rotor, dual stator capacitor with a range of 100-0-100 mmf. The range is extended 800 mmf by the addition of capacitance lumps in decade arrangement as required. Final readout of the characteristic values is accomplished in the same manner as with the DC resistance bridge.

Mutual Capacitance:

Mutual capacitance of the cable conductors is measured by means of an AC circuit which provides a voltage and a meter indication directly proportional to the capacitance. A DC voltage is then derived from this AC circuit and fed through a computing network into the recorder so that the readout is in microfarads per mile. In order to obtain a reading of microfarads per mile regardless of length of cable tested, a 528-ohm resistor is inserted in the computing network leading to the readout feature of the circuit. The component compensating for the varying cable lengths is a 10,000-ohm potentiometer.

* * *

Figure 5 shows this electrical network.

Conclusion

These ideas and their development have been crystallized into an automatic set for testing one type of cable, in conjunction with a recent expansion program at the Baltimore Works of the Western Electric Company. A complete view of this set was shown in Figure 1.

* * *

The switching relays revealed by the open panel at the top can handle up to 34 cable conductors at one time. The test programmer in the lower opening consists of stepping selectors capable of up to 51 consecutive tests in any one sequence. Only three parameters are measured by this set-mutual capacitance by meter, DC conductor resistance, and 900 cycle capacitance unbalance. The characteristic values are printed on a modi-

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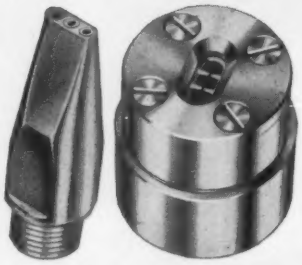

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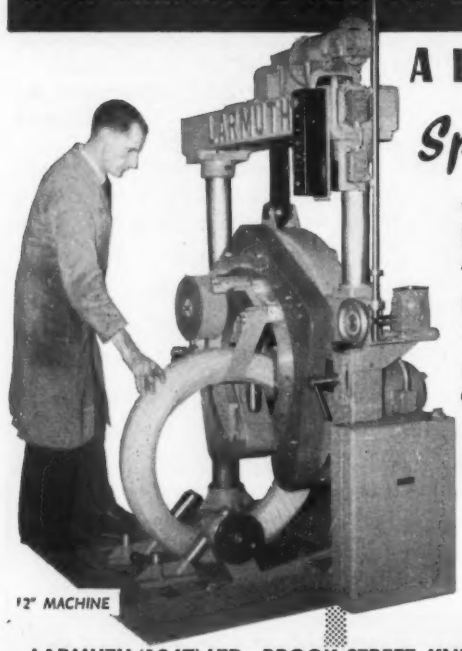

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fied commercially available chart type recorder.

* * *

The application of automation to the testing of communication cables materially reduces the number of man-hours required for this function. The resultant savings are augmented by the intangible savings which accrue from the elimination of the human element, and the consequent increased reliability of results and assurance of product quality.

To Handle Elgin Abrasives

The Abrasives Division of the **Elgin National Watch Company** has announced the appointment of seven new distributor organizations to handle sales of its diamond wheel products.

* * *

The distributors and their locations are:

R. Van Alstine Tool Company
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Rose, Kimball and Baxter, Inc.
511 Baldwin Street
Elmira, New York

Maxwell-Padelford Co., Inc.
17 Brook Road
Needham Heights 94, Mass.

Helco
3427 Missouri
St. Louis, Missouri

R & D Tool and Supply
3140 Midway Drive
San Diego 10, Calif.

M. J. Kelly Supply Corp.
323 Water Street
Syracuse, New York

Elco Tool Co.
1515 Wells Street
Fort Wayne, Indiana

* * *

The Abrasives Division manufactures a full line of diamond wheels as well as diamond powders and compounds, solid carbide rotary tools and Elgiloy products.

To Have New Office Building

Copperweld Steel Company started construction in July on an office building for its Wire & Cable Div. at Glassport, Pa., The three story building will cost about $250,000, says F. E. Leib, vice president in charge of the division, and will contain about 15,000 sq. ft. of space to house the division's headquarters staff.

Capabilities of Qualified Technical People in the Older Age Group

(*Continued from Page 993*)

drawings or tooling but we had experienced people. As we do on all our projects, we organized a group with a project leader supported with three designers, one mechanical, one structural and one for thermal equipment. A group of 11 detailers made the finished drawings. Of the group of 15 people, four were over 70, one of whom was 78, three over 65, the rest being mere youngsters from 56 to 25 years of age. Our contract called for six months delivery and we shipped the last week in April, the date we had specified to our customer. Without the experience of the people involved, this accomplishment would not have been possible.

* * *

On a manufacturing job, Mohawk takes complete responsibility for the quality and scheduling of the work, although we farm the work out to specialty shops in our area associated with us. Shops of this type have skilled workmen and good machinery but they often lack capacity for good scheduling and for intensive methods analysis to improve costs. Mohawk supplies these functions by utilizing our active retired manufacturing people to order materials, coordinate activities in several shops working on the same project and, most importantly, to consult with the shop people to suggest methods to improve manufacturing operations. Our man on this work right now, at age 63, has had nearly 40 years experience in machining, sheet metal work, wiring activities, and was a former department general foreman. Such talent is invaluable to us on manufacturing jobs ranging from production of large machinery to our die holing service where we must put holes in wire enamel dies to a ½ mil tolerance.

* * *

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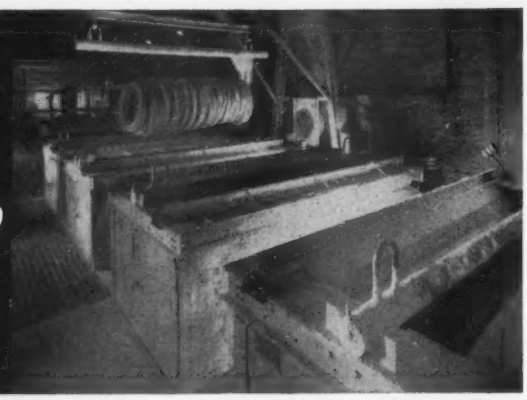

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* * *

For those of you concerned with manpower requirements, we urge that you consider finding ways to use the active retired people. On the basis of nearly 13 years experience working with such people we believe that you will find the results both effective and profitable.

New Bolt Design Announced

A new design high strength bolt with larger head and shorter thread length will substantially increase present advantage of high strength bolts over other types of structural fasteners, according to **Russell, Burdsall & Ward Bolt and Nut Company,** Port Chester, N. Y.

* * *

Savings up to 40 per cent in bearing-type connections over present high strength bolts are made possible by the new head and thread design. The new design has been approved after extensive testing sponsored by the Research Council of Riveted and Bolted Structural Joints and by the American Institute of Steel Construction.

* * *

The high strength bolt has in less than a decade become the dominant mechanical fastening method for structural steel. Its use has spread through other industries, allowing use of smaller diameter fasteners in a wide variety of applications.

Directory of Dutch Firms The Commercial Intelligence Office

Oudebrugsteed 16, Amsterdam-C., Netherlands, has issued its annual BUHOVA Trade Letter containing the names and addresses of the firms in that country who are interested in trade relations with concerns abroad.

Following each name is a list of products made.

* * *

Copies of the Trade Letter may be secured by writing the office above mentioned.

Controlling Crosstalk in Cable Stranding

(*Continued from Page 991*)

Figure 3. — Flyer stranders for exchange area cable units. * * * * * * *

Figure 4. — Cabler used to assemble individual units into multiple unit cables. * *

Figure 5. — A newer type strander-cabler for Inside Wiring and Switchboard Cables having up to 6 units or 312 conductors. * * *

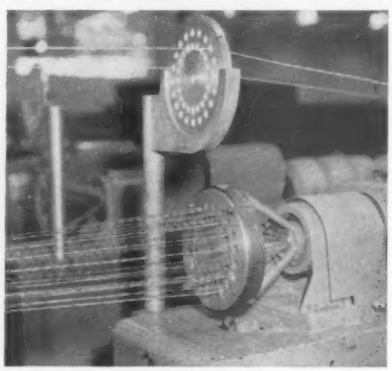
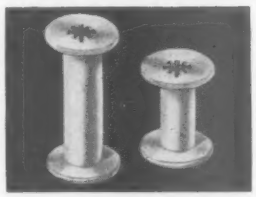


Figure 6. — An individual unit binder equipped with oscillating face plates for strander-cabler per figure 5. * * *

312 conductors. (Figs. 5 & 6 — Omaha Switchboard Cable Strander and Oscillating Face Plates)

PLAMENCO Nylon SPOOLS



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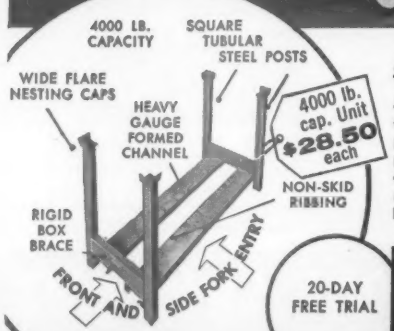

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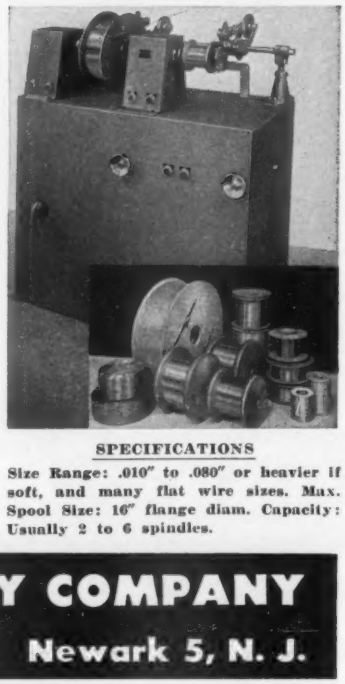
The New Model 1900-HVE Multi-Spindle Spooler (up to 16 Heads), engineered to include a variable speed system for adjustment of spindle speed, pitch, and traverse. This complete flexibility of adjustment makes a very uniform layer wound package which prevents binding and kinking during pay-off.

The 1900-HVE Spooler is a ruggedly built machine, using precision ball bearings at all rotating members. The adjustments are repeatable, and easily made while the machine is running. It is completely adaptable to the changing demands of the wire industry. A speed range of 18 to 1 is available. It contains the knowledge and experience of over 60 years of wire machine building.

Your special requirements can be incorporated in the design.

You are invited to consult us on your wire spooling problems. Our engineering resources and Winding Machines have been the standard of the industry. Most every major plant has Emory equipment.



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Size Range: .010" to .080" or heavier if soft, and many flat wire sizes. Max. Spool Size: 16" flange diam. Capacity: Usually 2 to 6 spindles.

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31 East Runyon Street Newark 5, N. J.

Larger strander cablers are being used at Omaha to manufacture PIC cables having up to 16 units or 400 pairs using oscillating face plates. (Figs. 7 & 8 — PIC Strander and Oscillating Face Plates) These strander cablers at Omaha were developed jointly by Kearny, Hawthorne, Omaha and Tonawanda engineers.

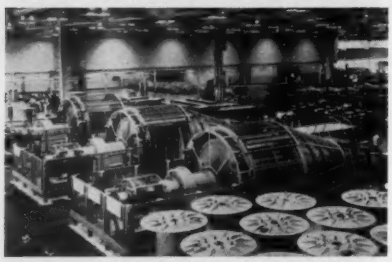


Figure 7. — Strander-cabler for polyethylene insulated exchange area cables having up to 16 units or 400 pairs. * * * * *

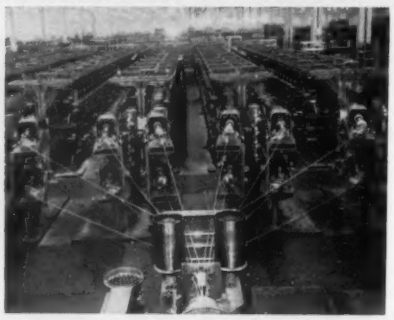


Figure 8. — A bank of individual unit binders equipped with oscillating face plates for strander-cabler per figure 7. * * *

* * *

Oscillating face plates are also used at Kearny, Hawthorne and Baltimore on flyer stranders making PIC cables up to 7 units or 100 pairs. (Fig. 9 — Flyer Oscillator)

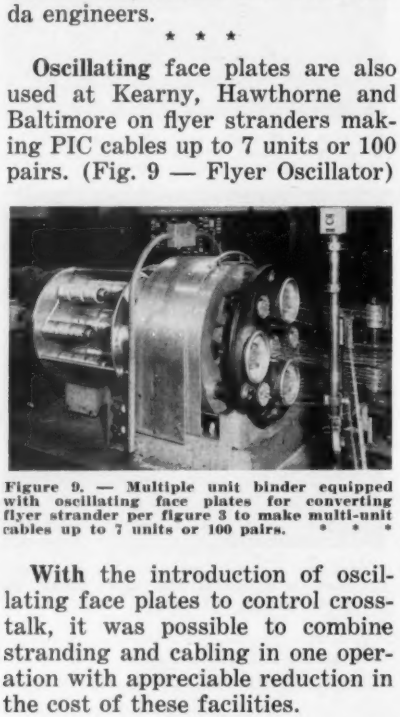


Figure 9. — Multiple unit binder equipped with oscillating face plates for converting flyer strander per figure 3 to make multi-unit cables up to 7 units or 100 pairs. * * *

With the introduction of oscillating face plates to control crosstalk, it was possible to combine stranding and cabling in one operation with appreciable reduction in the cost of these facilities.

Norton Marks 75th Anniversary

"Grits and Grinds," The publication of the **Norton Company,** Worcester 6, Mass., is devoted to the seventy-five year history of the firm.

* * *

The lead article by **George N. Jeppson,** Chairman of the Board, describes the early days of the company when, from a pottery background, the first grinding wheel was turned out. While little interest in it was evinced at the outset, the wheels were steadily improved and their acceptance by the metal trades led to the establishment of the Norton Emery Wheel Company, the genesis of the present and huge enterprise.

* * *

Concurrent with the anniversary observance, Norton has completed and placed in full operation its plant No. 8, that houses the manufacture of all organic bonded grinding wheels, a focal point in the company's abrasives product empire that culminates its three quarters of a century experience in this field.

Fatigue-Proof Bars

An informative Case Study Portfolio, showing a variety of applications of "FATIGUE-PROOF" Steel Bars in metalworking machinery and equipment parts, has been made available by **La Salle Steel Company,** Chicago, Ill. Containing a total of nine individual case studies, the portfolio shows how manufacturers are meeting and solving difficult problems related to parts production.

* * *

Each case study describes the machinery, specific part involved and the material it replaced. Included is information concerning the elimination of heat treating, straightening, grinding and distortion, plus improvements in machinability, wear and cost.

* * *

For the first in the series, applying to metalworking machinery and equipment, ask for Case Study Portfolio No. 1. Address your request to **W. E. Schneider, LaSalle Steel Company,** P.O. Box 6800-A, Chicago 80, Ill.

DOUBLE TWIST QUADDING MACHINE

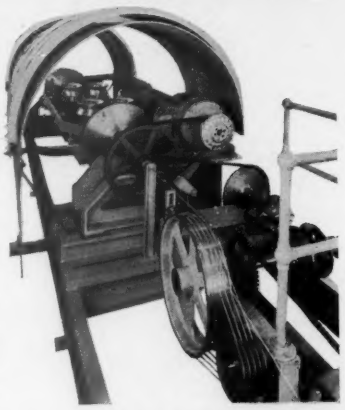
The photo shows our High Speed Light Duty Double Twist Quadding Machine viewed from the out put end.

In this construction all four reels are placed in the cradle. Each reel is mounted on an independent mandrel, rotating freely on anti-friction bearings and fitted with our patented Constant Tension and Over-Run Prevention Device.

Reel sizes vary up to 24 inches in diameter and 12 inches over all width.

Production from 1000 to 1400 twists per minute, depending upon reel size.

In size this machine is slightly wider and larger than our Standard Two Wire 30" Frame Twister.



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Measuring Machines
Capstans
Cable Strippers
Braiding Equipment
Twinners, Stranders, Cablers, Bunchers
Spark Testers
Printing Machines
Spiral Striping Machinery
Taping Equipment
Fine Wire Takeup and Respooling Equipment
Wire Drawing Machines
Specially Built Equipment
And Much More

SUPPLIES

Wire Drawing Dies
Wire Drawing Spools
All Types of Reels and Spools
Lithographed Spools
Inks for Printing Machines
Bare, Tinned and Silver Plated Copper Wire; Stainless Steel, Silver, Nickel, Bronze, Brass and Other Bare Wires
Numerous Other Items

all the wire industry in the West looks to 2 companies

First, there's Western Wire & Textile Machinery, Inc., the only company in the West that deals exclusively in used and reconditioned wire and cable-making equipment.

Secondly, there's the Paul I. Kenner Co., supplier and distributor of new wire and cable manufacturing machinery and supplies.

Nowhere else in the West will you have a better chance of finding exactly what you need---either new or used. Nowhere else in the West will you be able to trade in old equipment on new. Nowhere in the West will you find such a complete stock of machinery and equipment.

You'll like dealing with men who speak your business language---with companies backed by 20 years of highly specialized experience.

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Takeups • Payoffs • Braiders • Asbestos Carding Lines • Taping Machines • 7 Stranders, 1 for 6 x 4 inch spools, 1 for 16 x 9 inch reels • New England Butt 24" buncher.

2 Two companies that provide all that's needed, new and used for the West's wire industry.

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Our rigid laboratory controls guarantee unfailing uniformity of Hyprez grading and concentration. That's one important reason for Hyprez superior performance—shorter finishing time—longer die life, greater production. Want proof? Ask your nearby Hyprez distributor for a free demonstration.

. . . or write for Technical Bulletin HW-49

HYPREZ DIVISION
ENGIS EQUIPMENT CO.
431 S. Dearborn St., Chicago 5, Illinois

The West Coast Regional Meeting in Los Angeles

(*Continued from Page 986*)

poration; and the **Planett Manufacturing Company.**

* * *

Dinner followed at 7:30 P.M., at which **Earl R. Potter,** President and General Manager of **Industrial Wire Products Corporation,** acted as Master of Ceremonies, handling the distribution of the many attractive door prizes and introducing the after-dinner speaker, **Dr. Jose Fernando Matchado,** in real life **Chester J. Gruber,** newspaper publisher, author, and humorist, who spoke on the "Relations Between the Two Americas." This talk proved to be a highly entertaining hit, drawing much laughter from his lampooning of various of the notables present.

* * *

260 persons attended the dinner, twenty of whom were ladies.

* * *

The firms who so generously contributed the attractive door prizes were:

Banner Metals Mfg. Co.
Acme Wire Products Co.
Brooks Oil Co.
Amchem Products, Inc.
California Spring Co.
City Wire & Iron Works, Inc.
Metallurgical Products Dept., G. E. Co.
Drake Steel Supply Co.
Wilbur B. Driver Co.
Dal Rae Restaurant
Firth Sterling, Inc.
Gardner-Clark Spring Mfg. Co.
Griffin Coil Spring Co.
Hedalloy Die Corp.
Holister Coil Spring Mfg. Co.
Industrial Wire Products Corp.
Industrial Compounds Co.
Johnson Steel & Wire Co.
K-lath Co.
Krusen Steel & Wire Co.
Morgan Construction Co.
Bob Martin Co.
New England High Carbon Co.
Nichols Wire & Aluminum Co.
Pacific Smelting Co.
Pacific Wire Rope Co.
Perlmuth Electronic Associates
Rapid Wire Products Co.
J. A. Roebling & Sons Div.
Standard Industrial Compounds Co.
Vaughn Machinery Company
Wilshire Mfg. Co.
G. F. Wright Steel & Wire Co.
Z. Zoraster

* * *

The meeting proved to be all that the Association's members and guests hoped for. The men who planned and conducted it were:

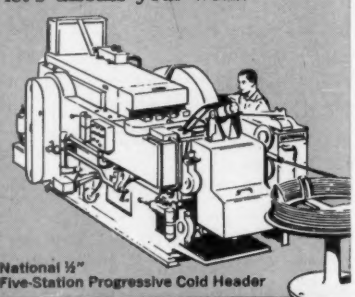
Joseph F. Conlan, Pres. (Chairman)
City Wire & Iron Works, Inc.

still more parts from wire!

These important parts are cold-formed from coiled wire, start to finish in compact, efficient National Cold Headers.

These parts are formed practically scrapless. All achieve remarkable savings over past methods.

If you make odd-shaped parts, may we help you evaluate them for cold-forming from wire? Better yet, come to Tiffin, witness our demonstrations and let's discuss your work.



National ½" Five-Station Progressive Cold Header

NATIONAL MACHINERY CO.
TIFFIN, OHIO, U.S.A.
HARTFORD DETROIT CHICAGO

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K. H. Davis Wire & Cable Corp.
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Columbia-Geneva Steel Div.
United States Steel Corp.
James Nixon, Wire Sales
The Colorado Fuel & Iron Corp.
Earl K. Potter, Pres. & Gen. Mgr.
Industrial Wire Products Corp.
Peter Siemons, Asst. Treas.
Plannet Manufacturing Co.
Clyde Wilson, Wire Sales
Pacific Coast Division
Bethlehem Steel Corp.

* * *

Hats are off to the foregoing gentlemen for the excellent program arranged in this successful 1960 meeting. The officers and directors, most of whom were present, extend to them their felicitations and a hearty expression of appreciation.

Cable — World Wide Today

(*Continued from Page* 982)

Gentlemen, unless we take a firm stand to see that our companies make a just return — our condition will get worse. This country can certainly hold its own, and to be sure, while foreign manufacturers do enter our markets, we can be in the best position to operate more efficiently to offset this trend.

* * *

Sales Departments should be made to realize that they can't get **all** the business and each and every manufacturer is only entitled to his proportionate share — and that's all he gets, no matter what he does — so we might just as well make a profit on what we're doing. Constantly lowering of selling prices with little or no regard to cost is downright foolishness.

* * *

In summation, let us try to:

Create real interest on the part of workers.
Produce quality merchandise.
Eliminate complacency.
Develop new and better methods.
Lower costs legitimately.

* * *

Don't be afraid of so-called "competition" — and above all, do not try to get **all** the business — it cannot be done.

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MUSIC WIRE and SPECIAL WIRES
Music Wire for Industrial Purposes
211 sizes Bright Polished, .0015" to .250"
45 sizes Bright Tinned, .005 to .125"
Aluminum—Annealed—Belt Lacing—Brass, Soft and Spring—Copper, Bare and Tinned
Coppered Steel Spring—Galvanized—Tinned
Monel—Nickel Silver—Pure Soft Nickel—Oil Tempered, Steel Spring, Black Finish
Phosphor Bronze, Spring Temper—Pure Iron Wire—Resistance Wire,
Hoskins Chromel "A"—Stainless, Soft and Spring Temper—Tag Wire, 1000
in an Envelope—Florist Wire—Spooled and Coiled, ¼-½-1-5#
Wires Straightened and Cut to length—Small Gauges—Small orders our specialty
Wires and Strands for the fishermen. Trolling Wires, Copper-Monel-Stainless.
Leader Wires, "Wilstabrite" Stainless and "Silverbrite" Music.
Dental and Surgical Wires, large assortment.
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STRANDERS, 7-BAY AND 12-BAY
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48" STANDARD DAVIS DUAL CAPSTAN
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TERKELSEN PAPER WRAPPING MACHINE
MULTI-WIRE TAKE-UP FRAMES
MANY OTHER ITEMS
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Portable

Electric Carbon Block Brazer

For fast, clean, silver brazing of wire. Requires less skill and instruction than gas brazing. Produces consistently good welds.

For wire sizes: No. 14 to No. 36 AWG

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MACHINERY FOR HIGH SPEED PRODUCTION

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- BUNCHERS
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PRESIDENT

THE SYMBOL OF EXCELLENCE IN WIRE PROCESSING AND TESTING EQUIPMENT

The New Nickel Alloys in Wire For Special Applications

(*Continued from Page* 981)

because of the doubtful creep and relaxation characteristics of the welded area.

* * *

When the redrawer receives his raw stock from the mill, (it may be 9/16", 1/2", 7/16", 3/8", 5/16", 1/4", round, square, or hex stock) he then carefully segregates this material by alloy, temper, and finish. The coils will be tagged at the mill with the melt number, and as a further precaution the redrawer adds a metal tag of particular shape as an identification. The coils are further segregated by composition so they may be readily chosen for the proper end use.

* * *

After the order is finished further tests are run to check the analysis and temper. Some of these tests are magnetic resistance, electrographic, and where required, a wet analysis will be made. It should also be mentioned that there is a stress-strain diagram made on each heat for each order. In addition to this, pilot tests are run on the heat treatable alloys to see if the material will meet the requirements of the specifications for aged material. The International Nickel Company will furnish the redraw mill with the complete chemical analysis for each heat.

* * *

The breakdown of the wire is all done by cold drawing. However, prior to drawing the raw stock is annealed and quenched, then pickled and copper coated to facilitate cold drawing. The maximum amount of reduction that can be made on these alloys is about 50-65%, then the material has to be reannealed to permit further work. Before reannealing the wire has to be pickled to remove the drawing lubricant and then the whole process is started over again.

* * *

One reason why the redraw mills are so particular about end use is in order to know how to program the die changes to end with the proper temper, grain size, and mechanical properties. As can be un-

derstood, heading wire differs from weaving wire and both differ from spring wire. The tensile, shear, and yield properties can be drastically changed within the same heat by changing the method of drawing and the intermediate anneals. To illustrate this, The Techalloy Company has developed what they refer to as a "grain coarsened anneal" which has improved the spring properties of Inconel wire.

* * *

The dies that are used in producing these wires are both tungsten carbide and diamond. Normally tungsten carbide is used on wire sizes .040 and larger, while diamond dies are used on the smaller diameter wires. Generally, wire under .018 will be drawn wet where the larger sizes are drawn dry.

* * *

The machinery that is used in the steel wire industry is for the most part the same machinery that is used in the drawing of the high nickel alloys, that is, Vaughn, Morgan, Syncro, etc.

* * *

Industry depends on its suppliers for information and materials. We might consider these two to be coupled, as very often the supplier who can furnish the proper information will be the one to supply the material. This points out the responsibility that the material supplier has to be ever aware of the new materials that are available and how they can fit his customers' needs.

* * *

I would like to acknowledge the following for their assistance in helping me prepare this paper, and to express my appreciation for their excellent cooperation:

Driver Harris Co., Mr. W. P. Smith
International Nickel Co., Mr. R. E. Thomas
Techalloy Co., Mr. R. J. Cubbler

Lead Base Gear Lubricants

(*Continued from Page* 983)

opinion that only the finest gear lubricants should be used to preclude high operational costs in industry.

STAINLESS STEEL WIRE

Holds World's record for Productivity & Export

NAS

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Dia: 0. 324" ~0. 0016"

Capacity: 350 tons (monthly)

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TRADITIONAL IMPORTERS OF STEEL PRODUCTS

Wire Rods and Wire, bright basic, black annealed, and galvanized, in all usual qualities and for many specialty purposes, including Box Binding Wire, Spring Wire, Mattress Wire, Core Wire, Rope Wire, etc.

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WIRE DRAWING MACHINERY

AND EQUIPMENT

FINE WIRE MACHINES • SPOOLERS • POINTERS
PATENTING, TEMPERING, GALVANIZING AND TINNING EQUIPMENT FOR WIRE

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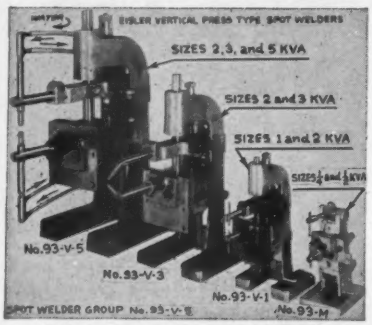

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Pulverized Quick Lime
Hydrated Lime
Pebble Lime
WARNER COMPANY
Sales Offices
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Pittsburgh New York

Progress Report on Molybdenum Disulfide as a Ferrous Wire Drawing Lubricant

(*Continued from Page 999*)

the '#110 Suspension' is being diluted with 50 parts of water.

* * *

Case #23: A Midwestern nail manufacturer has also started experiments with moly in the wire drawing operation. By adding five per cent 'Pure Moly Powder' to a metallic soap in the ripper die box of a multiple-pass machine, the company obtained little or no advantage in the cold heading operation. Initial testing using higher moly concentrations in the closing draw boxes has indicated improved performance in cold heading.

* * *

Case #24: A Southern low carbon mill has now gone into production with six per cent 'Pure Moly Powder' in a calcium stearate soap. In this operation the rod is mechanically descaled and no further pretreatment is given prior to drawing. Reported die life increases average 200 per cent and pulling motor drag is noticeably less.

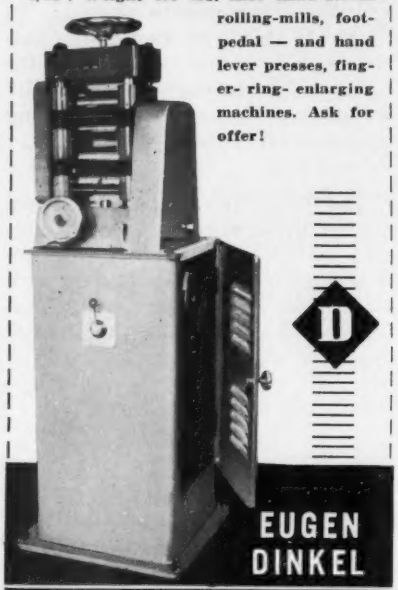
* * *

Case #25: One large New England low carbon mill, which is now starting experiments with moly in wire drawing lubricants, has been a regular user of 'Tech Moly Powder.' This mill burnishes the powder onto the capstans of their Morgan machines to eliminate the danger of galling and seizing as the wire slides up on the capstans.

* * *

The great number of successful applications in the past few months indicates that moly will be used more and more in the wire industry. A word of warning should be given however. In many of the cases cited above, success with moly was not immediately obtained and it was only after a number of experiments that satisfactory results were achieved. As research in production testing becomes more widely spread and more thorough, it is expected that

DOUBLE ROLLING-MILL,
electric-driven, rollers 2.½" x 5.⅛" long. for sheets ⅜" to 1/128", for wires 5/16" to 1/25". Weight 495 lbs. Also hand-driven rolling-mills, foot-pedal — and hand lever presses, finger- ring- enlarging machines. Ask for offer!



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All sizes from .104" down to .0004" in stock

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greater performance results will be obtained with moly.

Bulletin on Force Control Switches

Bulletin 49E describes the Dillon line of Force Control Switches which operate in compression or tension and which can trigger as many as four separated operations. This device starts and stops motors, relays, sounds audible warnings or activates visual signals. Available in six basic capacities, any one of which may be set for a specific load point or points within its range.

* * *

New sub-miniature models — slightly longer than a paper clip — operate in the same manner as higher capacities, but have the advantage of fitting into extremely small working space. They cover ranges of 0-5, 0-30 and 0-100 pounds.

* * *

Prices and all pertinent engineering data is given in this one brochure so that the reader may reach a decision. For a copy, write **W. C. Dillon & Co.**, P.O. Box 3008, Van Nuys, Calif.

Ransohoff Appoints West Coast Representative

R. C. Wigger, Executive Vice-President, **Ransohoff Company,** Hamilton, Ohio, has announced the appointment of Earle C. Call & Associates as Ransohoff sales engineering representative in the San Francisco area.

* * *

Mr. Call has had considerable experience as a consulting engineer, and for 12 years he was a manufacturer's representative in New York State for industrial heating, metal cleaning and finishing equipment, as well as electronic control systems and paint finishing systems.

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For assured quality, accurately graded diamond powders

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Satisfactory DIAMOND DIES can only be made by those who have experience, skill and knowledge. WAYNE has all of these. Users have called WAYNE DIES "the best."

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Furnished semi-finished to within .001" to .002" of finished size at rough-drilled die prices. Require only light sizing and polishing before using. Our dies embody special design features that make for superior performance.

ALSO, A FULL LINE OF CARBIDE TOOLING FOR THE COLD HEADING INDUSTRY

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EXPERT RECUTTING
DIAMOND DIES, DIAMOND POWDERS
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DIE RECUTTING SERVICE
CARBIDE DIES • TOOLS • PARTS
RUSCH WIRE DIE CORPORATION
CROTON-ON-HUDSON, N. Y.

Wire Kinks

(*Continued from Page* 1003)

and are considered to be dies, as they are long strips of metal with a graduated series of tapered holes. They may, of course, have served another purpose, as for drawing strips of rawhide to produce rawhide lacings.

* * *

History is silent on the matter of dies up to about 165 years ago when an account of how wire dies were made was recorded. Pot metal was cracked up, melted and cast onto an iron plate. This was cracked again, remelted and so on through several cycles to finally produce what vaguely may have been something between white cast iron and hyper-eutectoid steel. Then a wrought iron plate was prepared and the crushed metal was placed on the iron plate, heated in clay, hammered, reheated, hammered again, until the two metals were bonded into one solid piece. Holes were punched through the metal when hot and a wire drawing die resulted.

* * *

The iron die was used in various forms and in changing methods of fabrication up to the introduction of the carbide die. Chilled cast iron dies appear to have been an American development, their use by some die-hard wire mills persisting up to less than two decades ago.

New Look In Bolts

A plastic that won't flow when squeezed under a heavy load is giving new life to the common steel bolt which is used by industry to hold together everything from autos and bridges to farmers' silos.

* * *

Bolts, work horses of the metal fabricating industry, are being capped with a durable and corrosion-resistant plastic to extend their usable life under high-rust or chemically-corrosive conditions.

* * *

The capping method was developed by **Clear-Cite Products** of Chicago, specialists in plastic coatings and moldings. The company came up with the technique while searching for a way to cut basic

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SPOOLERS — TRAVERSES
TEFLON EXTRUDER

costs of huge glass-lined steel silos made by A. O. Smith Co. Each silo was formerly held together by 5,000 stainless steel-topped bolts.

* * *

Expensive stainless steel was necessary because the juices

Plastic capped bolts. * * * * * * * *

formed by silage are highly corrosive. The stainless steel-topped bolts also required use of asbestos gaskets to make a tight seal.

* * *

When an attempt was made to use plastic in place of stainless steel, the first plastics failed because the thin plastic layer molded over the bolt head was squeezed off the underside of the head when it was tightened with the 30 pounds of torque required in silo building.

* * *

This "squeezing" problem was solved when Clear-Cite tried Kralastic MM, a new ABS plastic developed by the Naugatuck Chemical division, **United States Rubber Co.** This resin-rubber plastic is designed to resist cold flow under loads. Although just a fraction of an inch of this plastic is molded in a layer over the bolt head, it proved strong enough to resist the high torque squeezing action.

* * *

Millions of the plastic-capped bolts are now in production for Smith silos. Their cost is about half that of the bolts capped with stainless steel. Meanwhile other uses for the new bolts are being sought.

* * *

A major electric company is considering use of the bolts in wir-

The Federal Manufacturing Co.
PLANETARY CABLERS
PAYOFFS-TAKEUPS
CAPSTANS-RESPOOLERS
2-3 WHEEL MEASURING MACHINES
COILING & RIBBON CABLING
TESTERS
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METALLIZING WIRE
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Thoroughly experienced stainless round and flat wire salesman able to purchase $25,000.00 of Company stock, and participate full time as Sales V.P. in small Midwest stainless and specialty wire mill now being organized and incorporated. Send complete resume in confidence to principal.
Reply to Box 1036
WIRE & WIRE PRODUCTS
453 Main Street Stamford, Conn.

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453 Main Street Stamford, Conn.

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453 Main St. Stamford, Conn.

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WIRE AND WIRE PRODUCTS
The Wire Man's Magazine

ing devices and large steel components. They are also under consideration for galvanized farm buildings, metal-plating tanks, outdoor signs and many other special metal fabricating applications where rust or corrosion is a problem.

Appointed To Represent MPM

Muro Plastics Company, 801 Spring St., Seattle 4, Wash., has been appointed by **Modern Plastic Machinery Corp.,** Clifton, N. J., as exclusive representative for the states of Alaska, Idaho, Hawaii, Montana, Oregon, Utah, Washington, and Wyoming, and the provinces of Alberta, British Columbia, Manitoba, and Saskatchewan, **F. J. Maywald,** MPM's Vice President has announced.

* * *

The Muro organization, consultants and representatives for plastic processing equipment and plastic raw materials, was established in June 1959 by **Francis M. Muro,** who has had long experience in the field.

Building Wire "Footprinted"

Federal Wire & Cable Co. Ltd., Guelph, Ont., Canada, an H. K. Porter Co. subsidiary, is marking its building wire with footage numbers that indicate the length of wire on a reel. These numbers run consecutively from 1 to 1000, and a distributor or contractor now is able to cut the exact length of wire needed for a wiring job. The system eliminates the need for using measuring machines and also enables a customer to tell how much wire is left on a partially used reel. The number printing process, developed by Federal engineers, prints the footage on the wire sheathing before the final protective coating is applied, so that the numbers will not rub off through handling.

Foreign Trade Trends

The 1960 edition of this book, containing 72 pages of text, tables and graphs, has been issued by the American Iron & Steel Institute, 150 E. 42nd Street, New York 17, N.Y.

* * *

Providing statistics on world production, exports and imports by product classifications, the book indicates, among other things, how our markets have suffered from the great influx of wire and wire products.

* * *

Copies of "Foreign Trade Trends" may be secured from the Institute at 50 cents each.

Wire Rope Slings

A 4-page folder, Bulletin DH-425, covering the new Double Green Stripe, ACCO-Registered VHS Strand-Laid Wire Rope Slings, said to be the strongest in the world, has been released by the Wire Rope Sling Department, American Chain & Cable Company, Inc., Wilkes-Barre, Pa.

* * *

Fabricated from a superior grade, uniform analysis, high carbon steel, the higher tensile strength of VHS (Very High Strength) wire is at least 15% stronger and safer than normal grades of Improved Plow Steel rope slings of the same diameter.

* * *

Construction details, advantages, rated capacities of the slings, having a safety factor of approximately 5:1, are listed and tabulated in easy-to-read form.

Fahey Becomes Associate Member of A.I.E.E.

John A. Fahey of Wire and Wire Products Magazine has recently been elected as an Associate Member of the American Institute of Electrical Engineers (AIEE). Mr. Fahey was formerly associated with The Connecticut Light and Power Co. for 10 Years in their distribution engineering department. He has been on the staff of Wire and Wire Products since April of this year and is a member of the Wire Association.

Corrosion-Resistant Staples

Staples used to splice lengths of film prior to processing are being made of Monel nickel-copper alloy because of its resistance to the highly corrosive film-developing solutions.

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ABRASIVES—
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Norton Co., Worcester, Mass.
Pangborn Corporation, Hagerstown, Md.

ACID INHIBITORS—
(See Inhibitors, Pickling)

ANNEALING MACHINES — Electric Resistance
Syncro Machine Co., Perth Amboy, N. J.

ANNEALING POTS AND BOXES—
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

BAKERS—
(See OVENS—Rod Bakers)

BOBBINS—Braider & Wire Weaving
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Associated American Winding Machinery, Inc., New York, N. Y.
Molded Fiber Glass Tray Co., Linesville, Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Plastic Mold & Engineering Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

BORAX—Wire Drawing
United States Borax & Chemical Corp., New York, N. Y.

BORON CARBIDE—
Norton Co., Worcester, Mass.

CABLE FILLERS—Paper
Ludlow Papers, Needham Heights, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

CAPSTANS—for Wire (also Caterpiller Types)
Bartell Machine Tool Corp., Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Davis Electric Co., Wallingford, Conn.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Larmuth & Bulmer Limited, Manchester, England

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Carter & Co., Ltd., B. & F., Bolton, England
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

CASTINGS—Wire Mill
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CLEANERS—Metal
Apex Alkali Products Co., Phila., Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H., Co., Inc., Homer, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.
Standard Industrial Compounds Co., Frankfort, Ill.

CLEANING & PICKLING EQUIP.—
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, Ohio
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Wilson, Lee, Engr. Co., Cleveland, Ohio

CLOTH—WIRE, All Metals
Wickwire Bros., Cortland, N. Y.
Wisconsin Wire Works, Appleton, Wis.

COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H., Co., Homer, N. Y.
Parker Rust Proof Co., Detroit, Michigan
Standard Industrial Compounds Co., Frankfort, Ill.
United States Borax & Chemical Corp., New York, N. Y.

COLOR CONCENTRATES—For Wire Coatings
Blane Corporation, The, Canton, Mass.

COMPOUNDS—Coppering
Miller, R. H. Co., Inc., Homer, N. Y.

COMPOUNDS—Diamond (Pre-Mixed)
Eastern Carbide Corp., New Rochelle, N. Y.
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Rusch Wire Die Corporation, Croton-on-Hudson, N. Y.

COMPOUNDS—Extrusion, for Wire
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.

COMPOUNDS—Metal Finishing
Apex Alkali Products Co., Philadelphia, Pa.
Parker Rust Proof Co., Detroit, Michigan

COMPOUNDS—Phosphate Coating
Parker Rust Proof Co., Detroit, Michigan

COMPOUNDS—Rust Preventing
American Lanolin Corporation, Lawrence, Mass.
Apex Alkali Products Co., Philadelphia, Pa.
Parker Rust Proof Co., Detroit, Michigan

COMPOUNDS—Rust Removing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

COMPOUNDS—Vinyl
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
Escambia Chemical Corporation, New York, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Union Carbide Plastics Company, Div. of Union Carbide Corporation, New York, N. Y.

COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N. Y.
Miller, R. H. Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.
Swift & Company, Chicago, Ill.
United States Borax & Chemical Corp., New York, N. Y.

CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

CONTAINERS—Wire Packaging
(See DRUMS—Wire Packaging)

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

COUNTERS—
(See MACHINERY—Measuring Wire and Cable)

CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio

CUTTING TOOLS—Carbide
Eastern Carbide Corp., New Rochelle, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.

CUTTING TOOLS—Wire
Robinson, M. W. Co., Rockville, Conn.

DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIAMOND POWDERS—
Alabama Wire Die Co., Fayette, Ala.
Danforth Company, C.W., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Fort Wayne Diamond Products, Inc., Fort Wayne, Indiana
Hoosier Wire Die, Inc., Ft Wayne, Ind.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIAMOND POWDER RECLAIMING—
Danforth Company, C.W., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Fort Wayne Diamond Products, Inc., Fort Wayne, Indiana
Hoosier Wire Die, Inc., Ft Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DIAMOND TOOLS—
Alabama Wire Die Co., Fayette, Ala.
Indiana Wire Die Co., Ft. Wayne, Ind.
Wayne Wire Die Co., Linden, N. J.

DIES—Carbide, Tungsten & Tantalum
Alabama Wire Die Co., Fayette, Ala.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIES—Cold Heading
Alabama Wire Die Co., Fayette, Ala.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France

DIES—Diamond
Ajax Industrial Supplies, Inc., Ft. Wayne, Ind.
Alabama Wire Die Co., Fayette, Ala.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Ft. Wayne Wire Die Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Roux Wire Die Works, Inc., Oriskany, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIES DIAMOND—Reversible
Alabama Wire Die Co., Fayette, Ala.
Indiana Wire Die Company, Fort Wayne, Indiana
National Wire Die Co., Inc., New York, N. Y.

DIES—Extrusion
Central Tool and Machine Co., Bridgeport, Conn.
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France.
Rusch Wire Die Co., Croton-on-Hudson, N.Y.
Wayne Wire Die Co., Linden, N. J.

DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.

DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Pittsburgh Carbide Die Co., Monongahela, Pa.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Alabama Wire Die Co., Fayette, Ala.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
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Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
National Wire Die Co., Inc., New York, N. Y.

New England Wire Die Co., Worcester, Mass.
Roux Wire Die Works, Inc., Oriskany, N. Y.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Linden, N. J.

DIES—Roll Threading
Rivom, Dijon, France

DIES—Special Shapes, Etc.
Alabama Wire Die Co., Fayette, Ala.
Eastern Carbide Corp., New Rochelle, N. Y.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Rivom, Dijon, France

DIES—Swaging
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

DIES—Tinning
Roux Wire Die Works, Inc., Oriskany, N. Y.

DIES—Tube Drawing
Alabama Wire Die Co., Fayette, Ala.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Hoosier Wire Die., Inc., Ft. Wayne, Ind.
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Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Rivom, Dijon, France
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

DRAW BENCHES—
(See MACHINERY)—Draw Benches)

DRIVES—Variable Speed
Allis Co., Louis, Milwaukee, Wisc.

DRUMS—Wire Packaging
Hubbard Spool Company, Div., The American Pulley Co., Garrett, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

DRUMS & TRAVERSES—For Cable Reels
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Republic Steel Corp., Berger Div., Canton, Ohio

DRYING EQUIPMENT—
Carl Mayer Corp., The, Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FOAM PRODUCING COMPOUNDS—
Parkin Chemical Co., The, Pittsburgh, Pa.

FURNACES—Brazing
Ajax Electric Company, Philadelphia, Pa.

FURNACES—Galvanizing Equipment
Ofenbau Fritz, G.m.b.H. & Co., K. G., Hagen (W. Germany)
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Heat Treating
Ajax Electric Company, Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Ofenbau Fritz, G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Wilson Lee Engr. Co., Cleveland, Ohio

FURNACES—Pot (Oil, Gas, Electric)
Ajax Electric Company, Philadelphia, Pa.
Ofenbau Fritz, G.m.b.H. & Co. K. G., Hagen, (W.-Germany)

FURNACES—Salt Bath
Ajax Electric Company, Philadelphia, Pa.

FURNACES—Strand Annealing
Ajax Electric Company, Philadelphia, Pa.
Ofenbau Fritz, G.m.b.H. & Co. K. G., Hagen, (W. Germany)

GALVANIZING EQUIPMENT—(See MACHINERY—Galvanizing Wire)

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

GUIDES—For Wire
Heany Industrial Ceramic Corp., New Haven, Conn.

GUIDE TIPS—For Extruding Machines (See NOZZLES)

HAMMERS—Nail Heading
Pittsburgh Carbide Die Co., Monongahela, Pa.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

INHIBITORS—Pickling
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

INKS—Printing, for Insulated Wire
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.

INSULATING MATERIALS—
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
General Electric Company, Insulating Materials Section, Schenectady, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, Naugatuck, Conn.

LACQUERING SYSTEMS—See MACH.—Lacquering Electric Wire

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LIME—
Warner Co., The, Philadelphia and Bellefonte, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Swift & Co., Chicago, Ill.

MACHINE CONTROLS—Electronic
Allis Co., Louis, Milwaukee, Wisc.

MACHINERY—Armoring (Cable, Wire, Hose)
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

MACHINERY—Barbed Wire
Glader Wm., Machine Works, Chicago, Ill.

MACHINERY—Blast Cleaning
Pangborn Corporation, Hagerstown, Md.
Wheelabrator Corporation, Mishawaka, Ind.

MACHINERY—Bobbin Winders
Associated American Winding Machinery, Inc., New York, N. Y.
Larmuth and Bulmer, Limited, Manchester, England

MACHINERY—Bolt, Rivet, Screw, etc.
Boltmaster Co., The, Cleveland, Ohio
National Machinery Co., Tiffin, Ohio
Prutton Corporation, Cleveland, Ohio.
Straus-Artys Corp., Great Neck, N. Y.

MACHINERY—Braiding
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bunching
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.
Larmuth and Bulmer, Limited, Manchester, England
Miyazaki Iron Works, Ltd., Osaka, Japan
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Bundling, Scrap
Vaughn Machinery Co., Cuyahoga Falls, Ohio

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
Carter & Co., Ltd., B. & F., Bolton, England
Cook Mfg. Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Capstans (See Capstans and Machinery—Winding Wire)

MACHINERY—Centerless Grinding & Polishing
American Laubscher Corporation, New York, N. Y.

MACHINERY—Chain Link Fence
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Steel & Wire Machinery Co., Cleveland, Ohio
Wafios Machinery Corporation, Hackensack, N. J.

MACHINERY—Chain Making
Larmuth and Bulmer, Limited, Manchester, England
Steel & Wire Machinery Co., Cleveland, Ohio
Wafios Machinery Corp., Hackensack, N. J.

MACHINERY—Closing Cable
Carter & Co., Ltd., B. & F., Bolton, England
Larmuth and Bulmer, Limited, Manchester, England
Miyazaki Iron Works, Ltd., Osaka, Japan
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N.J.

MACHINERY—Coiling Rod
Coulter & MacKenzie Machine Co., Bridgeport, Conn.
Vaughn Mach'y Co., Cuyahoga Falls, Ohio

MACHINERY—Cold Heading
Boltmaster Co., The, Cleveland, Ohio
National Machinery Co., Tiffin, Ohio
Straus-Artys Corp., Great Neck, N. Y.

MACHINERY—Copper Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Herborn Machinery Corporation, Hackensack, N. J.
Johnson Machinery Co., Elizabeth, N. J.
Morgardshammars Mek Verkstads A. B., Morgardshammar, Sweden
National Mach'y Exch (Used), New York
Showa Machine Works, Ltd., Osaka, Japan
Steel & Wire Machinery Co., Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Watkins & Sons, Inc., R. S., Sandy Hook, Conn.
Whitacre Corporation, Alhambra, California

MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)

MACHINERY—Cutting
Eisler Engineering Company, Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Mettler Machine Tool, Inc., New Haven, Conn.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Dead Block (Stationary Coiler)
Morgan Construction Company, Worcester, Mass.
Wells Company, Frank L., Kenosha, Wisc.
Whitacre Corporation, Alhambra, California
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Descaling Rod, Dry
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Fisher Associates, New York, N. Y.
Herborn Machinery Corporation, Hackensack, N. J.
Pangborn Corporation, Hagerstown, Md.
Wheelabrator Corporation, Mishawaka, Ind.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Diameter Control
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Die Making
Boulin, Victor J., Inc., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Sjogren Tool & Machine Co., Auburn, Mass.
Wayne Wire Die Co., Linden, N. J.

MACHINERY—Draw Benches
American Laubscher Corporation, New York, N. Y.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Eccentricity Control (Insulated Wire)
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Edging (See MACHINERY—Tandem Rolling and Edging Mills)

MACHINERY—Enameling
Acrometal Products, Inc., Minneapolis, Minn.
American Insulating Mach'y Co., Phila., Pa.

Cook Manufacturing Co., The, Paterson, N. J.
Litzler Co., C. A., Cleveland, Ohio.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Extruding
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Johnson Machinery Co., Elizabeth, N. J.
Royle, John, & Sons, Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc (used) Pawtucket, R. I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Waflos Machinery Corp., Hackensack, N. J.

MACHINERY—Flat Wire
Fenn Manufacturing Company, Newington, Conn.
Herborn Machinery Corporation, Hackensack, N. J.
Mettler Machine Tool, Inc., New Haven, Conn.
Steel Equipment Company, Cleveland, Ohio
Steel & Wire Machinery Co., Cleveland, Ohio
Torrington Mfg. Co., Torrington, Conn.
Watkins & Sons, Inc., R. S., Sandy Hook, Conn.

MACHINERY—Forming Wire
National Mach'y Exch. (Used), New York, N. Y.
Nilson Machine Co., A. H., Shelton, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel & Wire Machinery Co., Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Waflos Machinery Corp., Hackensack, N. J.

MACHINERY—Footage Meters
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Galvanizing Wire
Miyazaki Iron Works, Ltd., Osaka, Japan
Orenbau Fritz G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Steel & Wire Machinery Co., Cleveland, Ohio
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Whitacre Corporation, Alhambra, California
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Gang Winders
Entwistle Manufacturing Corporation, Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Impregnation Control, Paper Cables
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.

MACHINERY—Insulating Wire
American Insulating Mach'y Co., Phila., Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler Co., C. A., Cleveland, Ohio.
Michigan Oven Company, Detroit, Mich.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Pourtier Pere et Fils, Romainville (Seine), France
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Insulation Testing (See MACHINERY—Spark Testing)

MACHINERY—Lacquering Electric Wire
American Insulating Mach'y Co., Philadelphia, Pa.
Cook Mfg. Co., The, Paterson, N. J.
Litzler Co., C. A., Cleveland, Ohio.
Michigan Oven Company, Detroit, Mich.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.
Waflos Machinery Corporation, Hackensack, N. J.

MACHINERY—Looms, Wire Weaving
EVG., Machinen & Stahl, A. G., Zurich, Switzerland

MACHINERY—Material Handling
(See Material Handling Equipment)

MACHINERY—Measuring Diam., Insulated Wire
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Measuring Wire & Cable
Davis Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wisc.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Larmuth and Bulmer, Limited, Manchester, England
National Standard Electronics, Inc., New York, N. Y.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Measuring and Control—Coating
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Measuring Width-Flat Wire
National Standard Electronics, Inc., New York, N. Y.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Machinery Co., Tiffin, Ohio
National Mach'y Exch. (Used), N.Y., N.Y.
Waflos Machinery Corp., Hackensack, N. J.

MACHINERY—Packaging Wire
Advanced Wyrepak Co., Inc., Bridgeport, Conn.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Whitacre Corporation, Alhambra, California

MACHINERY—Patenting Wire
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Whitacre Corporation, Alhambra, California

MACHINERY—Pin Making
Nilson Machine Co., A. H., Shelton, Conn.

MACHINERY—Plating
Bartell Machine Tool Corp., Rome, N. Y.
Universal Industrial Equipment Co., Secaucus, N. J.

MACHINERY—Pointing
Herborn Machinery Corporation, Hackensack, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N. Y.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Straus-Artys Corp., Great Neck, N. Y.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio

MACHINERY—Printing on Electric Wire
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M. Co., Inc., West Boylston, Mass.

MACHINERY—Re-Spooling
Acrometal Products, Inc., Minneapolis, Minn.
Associated American Winding Machinery, Inc., New York, N. Y.
Bartell Machine Tool Corp., Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Herborn Machinery Corporation, Hackensack, N. J.
Miyazaki Iron Works, Ltd., Osaka, Japan
National Mach'y Exch. (Used), New York, N. Y.
Vaughn Machinery Co., Cuyahoga Fall, Ohio
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Rod Mill
Baldwin-Lima-Hamilton, Industrial Division, New York, N. Y.
Herborn Machinery Corporation, Hackensack, N. J.
Morgan Construction Co., Worcester, Mass.

MACHINERY—Rolling Mill
Fenn Manufacturing Company, Newington, Conn.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Watkins & Sons, Inc., R. S., Sandy Hook, Conn.

MACHINERY—Rubber Insulating
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler Co., C. A., Cleveland, Ohio.
Royle, John & Sons, Paterson, N. J.
Western Wire & Textile Machinery, Inc., So San Francisco, Calif.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

MACHINERY—Serving
Pourtier Pere et Fils, Romainville (Seine), France
Wardwell Braiding Machine Co., Central Falls, R. I.

MACHINERY—Slitting Mills
Steel Equipment Company, Cleveland, Ohio

MACHINERY—Special
Watkins & Sons, Inc., R. S., Sandy Hook, Conn.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waflos Machinery Corp., Hackensack, N. J.
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Straightening & Cutting
American Laubscher Corporation, New York, N. Y.
Johnson Machinery Co., Elizabeth, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Patterson, George C. Machine Co., Cleveland Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Steel & Wire Machinery Co., Cleveland, Ohio
Waflos Machinery Corporation, Hackensack, N. J.
Wells Company, Frank L., Kenosha, Wisc.

MACHINERY—Stranding
Bartell Machine Tool Corp., Rome, N. Y.
Carter & Co., Ltd., B. & F., Bolton, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Johnson Machinery Co., Elizabeth, N. J.
Krupp, Fried., Machinen-Und Stahlbau Rheinhausen, Germany
Larmuth & Bulmer Limited, Manchester, England
Miyazaki Iron Works, Ltd., Osaka, Japan
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Swaging
Fenn Manufacturing Company, Newington, Conn.

MACHINERY—Tandem Rolling & Edging Mills
Fenn Manufacturing Company, Newington, Conn.

MACHINERY—Take-Up and Pay-Out
Acrometal Products, Inc., Minneapolis, Minn.
Advanced Wyrepak Co., Inc., Bridgeport, Conn.
American Insulating Mach'y Co., Phila., Pa.
Associated American Winding Machinery, Inc., New York, N. Y.
Bartell Machine Tool Corp., Rome, N. Y.
Colbourne Machine Company, Winsted, Conn.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
General Engineering Company (Radcliffe) Limited, Radcliffe, England
Johnson Machinery Co., Elizabeth, N. J.
Larmuth & Bulmer Limited, Manchester, England
Litzler Co., C. A., Cleveland, Ohio.
Miyazaki Iron Works, Ltd., Osaka, Japan
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Pourtier Pere et Fils, Romainville (Seine) France
Standard Mill Supply Co., Pawtucket, R. I.
Steel Equipment Company, Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.
Whitacre Corporation, Alhambra, California

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Pourtier Pere et Fils, Romainville (Seine) France
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

MACHINERY—Thread Rolling
Boltmaster Co., Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.
Prutton Corporation, Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.

Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Litzler Co., C. A., Cleveland, Ohio
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, (W.-Germany)
Syncro Machine Co., Perth Amboy, N. J.
Universal Industrial Equipment Co., Secaucus, N. J.
Whitacre Corporation, Alhambra, California

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, Ohio

MACHINERY—Tube Mill, Cold Drawing
Johnson Machinery Co., Elizabeth, N. J.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Mettler Machine Tool, Inc., New Haven, Conn.

MACHINERY—Twinning
(See Mach.—Bunching)

MACHINERY—Twisters, Wire
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.

MACHINERY—Used
Johnson Machinery Co., Elizabeth, N. J.
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.
Wire Machinery, Inc., Chicago, Ill.

MACHINERY—Welded Wire Mesh
EVG, Maschinen and Stahl, A.G., Zurich, Switzerland
Schlatter, Ltd., H. A., Zollikon/Zurich

MACHINERY—Variable Speed Drives
Allis Co., Louis, Milwaukee, Wisc.

MACHINERY—for Wire Welding
(See WELDERS—Butt and Spot and Machinery—Welding Wire Fabrics)

MACHINERY—Winding Wire
Associated American Winding Machinery, Inc., New York, N. Y.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Enjaco Corporation, Cranston, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Larmuth and Bulmer, Limited, Manchester, England
Miyazaki Iron Works, Ltd., Osaka, Japan
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Standard Mill Supply Co., Pawtucket, R. I.
Steel Equipment Company, Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Laubscher Corporation, New York, N. Y.
Cook Manufacturing Co., The, Paterson, N. J.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Fenn Manufacturing Company, Newington, Conn.
Herborn Machinery Corporation, Hackensack, N. J.
Johnson Machinery Co., Elizabeth, N. J.
Loma Machine Manufacturing Co., Inc., New York, N. Y.
Miyazaki Iron Works, Ltd., Osaka, Japan
Morgan Construction Co., Worcester, Mass.
Morgardshammars Mek Verkstads AB, Morgardshammar, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Showa Machine Works Ltd., Osaka, Japan
Sleeper & Hartley, Inc., Worcester, Mass.
Societa Generale Delle Macchine Mill, Milan, Italy
Steel Wire and Machinery Co., Cleveland, Ohio
Straus-Artys Corp., Great Neck, N. Y.
Superior Tool & Machinery Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio
Watkins & Sons, Inc., R. S., Sandy Hook, Conn.
Whitacre Corporation, Alhambra, California
Wire Machinery Inc., Chicago, Ill.

MACHINERY—Wire Preheating
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.

MACHINERY—Wire Rope
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Niehaus, K. A., Maschinenfabrik, Dusseldorf-Rath, Germany
Watson Machine Co., Paterson, N. J.

MACHINERY—Wrapping with Paper
American Laubscher Corp., New York, N. Y.
Terkelsen Machine Company, Boston, Mass.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, Ohio

MOTORS—Electric
Allis Co., Louis, Milwaukee, Wisc.

NAIL TOOLING—Tungsten Carbide
Pittsburgh Carbide Die Co., Monongahela, Pa.

NAILS—Wire
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Pan American Trade Development Corp. New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.

NIPPERS—Wire Cutting
Robinson, M. W. Co., Rockfall, Conn.

NOZZLES—For Extruding Machines
Central Tool and Machine Co., Bridgeport, Conn.

OVENS—Cable Lacquering and Enameling
American Insulating Mach'y Co., Phila., Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Colbourne Machine Company, Winsted, Conn.
Michigan Oven Company, Detroit, Mich.

OVENS—Rod Bakers
Carl Mayer Corp., The, Cleveland, Ohio

OVENS—Welding Rod Coating
Carl Mayer Corp., The, Cleveland, Ohio

PAILS—Packaging
(See Drums—Wire Packaging)

PAPER—Coil Wrapping
Ludlow Papers, Needham Heights, Mass.

PAPER—Insulating
Ludlow Papers, Needham Heights, Mass.
Plymouth Cordage Company, Plymkraft Division, Plymouth, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

PAY-OUT SYSTEMS—
(See MACHINERY—Take-Up & Pay-Out)

PHOSPHATE COATING CHEMICALS
(See COMPOUNDS—Phosphate Coating)

PICKLING COMPOUNDS—
See (Inhibitors—Pickling)

PLASTICIZERS—
Cary Chemicals, Inc., New Brunswick, N. J.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.

PLASTICS—for Wire Insulation
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
Escambia Chemical Corporation, New York, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Union Carbide Plastics Company, Div. of Union Carbide Corporation, New York, N. Y.
Union Carbide Corporation, Silicones Division, New York, N. Y.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, Naugatuck, Conn.

PRINTING WHEELS—for Electric Wire
Daniels & Co., Frank, New York, N. Y.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Co., Inc., West Hanover, Mass.
Gillies, Duncan M. Co., Inc., West Boylston, Mass.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, Ohio

RACKS—Wire Storage
Jarke Manufacturing Co., Chicago, Illinois

REEL AND TENSION STANDS—
Acrometal Products, Inc., Minneapolis, Minn.
Mettler Machine Tool, Inc., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Republic Steel Corp., Berger Div., Canton, Ohio

REELS—Metal Bound
Durkee Mfg. Co., Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.

REELS—Plywood
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.

REELS & SPOOLS—Steel (All Types)
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Clark Manufacturing Co., J. L., Rockford, Illinois.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
New York Engineering Corp., Yonkers, N. Y.
Republic Steel Corp., Berger Div., Canton, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS—Steel, for Rope and Cable
New York Engineering Corp., Yonkers, N. Y.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Molded Fiber Glass Tray Co., Linesville, Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Nelson Co., The, Baltimore, Md.
Republic Steel Corp., Berger Div., Canton, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

REELS & SPOOLS—Wood
American Wood Working Co., Montello, Wisc.
Bridge Mfg. Co., The, Hazardville, Conn.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Nelson Co., The, Baltimore, Md.

REFRACTIONS—High Temperature
Norton Company, Worcester, Mass.

ROD BAKERS—
(See OVENS—Rod Bakers)

RODS—Stainless Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio

RODS—Wire—Non-Ferrous
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.

RODS—Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Niederrheinische Huette, A. G., Duisburg, Germany
Pan American Trade Development Corp. New York, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

ROPE—Wire
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons, Div. Colorado Fuel & Iron Corp., Trenton, N. J.

RUST PROOF COMPOUNDS—
(See COMPOUNDS—RUST Removing)

RUST REMOVING COMPOUNDS—
(See COMPOUNDS—RUST Preventing)

SATURATION SYSTEMS—
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
(See COMPOUNDS—Wire Drawing)

SPOOLS—For Retail Sale of Wire
American Wood Working Co., Montello, Wisc.
Clark Manufacturing Co., J. L., Rockford, Illinois.

SPOOLS—Plastic
Associated American Winding Machinery, Inc, New York, N. Y.

Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Molded Fiber Glass Tray Co., Linesville, Pa.
Plastic Mold & Engineering Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.

STAMPINGS—Steel
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

STOCK STORAGE SYSTEMS
Jarke Manufacturing Co., Chicago, Illinois

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Roebling's, John A. Sons Div. Colorado Fuel & Iron Corp., Trenton, N. J.

TANKS—Ceramic, for Galvanizing
Ofenbau Fritz G.m.b.H. & Co. K. G., Hagen, W.-Germany)

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TENSION METERS—for Wire
Boulin Instrument Corporation, Pelham, N. Y.
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
Tensitron, Inc., Harvard, Mass.

TESTERS—INSULATION
(See Testing Equipment—for Dielectric Faults)

TESTING EQUIPMENT — Dielectric Faults in Insulation
Davis Electric Co., Wallingford, Conn.
Enjaco Corporation, Cranston, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Muirhead Instruments, Inc., (Addison Electric), New York, N. Y.
Peschel Electronics, Inc., Patterson, N. Y.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

TESTING EQUIPMENT — Physical
Scott Testers, Inc., Providence, R. I.

TINSEL—Electric Conductor
Montgomery Co., The, Windsor Locks, Conn.

TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper Silver and False Gold Coated, etc.
(See TINSEL—Electric Conductor)

TOOLS—Nail Machine
Pittsburgh Carbide Die Co., Monongahela, Pa.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

TRANSMISSIONS—Variable Speed (See Adjustible Speed Drives)

TRAVERSES & DRUMS—For Reels
(See Drums & Traverses)

TRAVERSE MECHANISMS—
Associated American Winding Machinery, Inc., New York, N. Y.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

VARNISHES & LACQUERS—for Electric Wire
General Electric Company, Insulating Materials Section, Schenectady, N. Y.

VULCANIZING PANS AND EQUIPMENT—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

WAXES—for Insulated Wire
Cary Chemicals, Inc., New Brunswick, N. J.

WELDERS—Spot and Butt and Welding Wire Fabrics
Eisler Engineering Corp., Newark, N. J.
EVG, Maschinen and Stahl, A.G., Zurich, Switzerland
Herborn Machinery Corporation, Hackensack, N. J.
Micro Products Co., Chicago, Ill.
Schlatter, Ltd., H. A., Zollikon-Zurich

WHEELS—for Printing on Electric Wire
Daniels & Co., Frank, New York, N. Y.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M., Co., Inc., West Boylston, Mass.

WIRE—Aluminum
Malin & Co., The, Cleveland, Ohio

WIRE—Ball
Marathon Specialty Steels, Inc., N. Y., N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Barbed
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

WIRE—Brass and Bronze
Malin & Co., The, Cleveland, Ohio
Wisconsin Wire Works, Appleton, Wis.

WIRE—Cadmium
Stamford Processing Co., Peekskill, N. Y.

WIRE—Cold Heading
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Copper
Malin & Co., The, Cleveland, Ohio

WIRE—Flat
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Jones & Laughlin Steel Corp, Stainless and Strip Div., Detroit, Mich.
Montgomery Co., The, Windsor Locks, Conn.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Galvanized
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Pan American Trade Development Corp., New York, N. Y.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Wickwire Spencer Steel Div., Colorado, Fuel & Iron Corp., New York, N. Y.

WIRE—High Carbon
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Detroit Steel Corporation, Detroit, Mich.
Marathon Specialty Steels, Inc., New York, N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Manufacturers
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Marathon Specialty Steels, Inc., N. Y., N. Y.
Republic Steel Corp., Berger Div., Canton, Ohio
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
U. S. Steel Corp., N. Y., N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Metalizing
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Platt Bros & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WIRE—Music
Malin & Co., The, Cleveland, Ohio

WIRE—Needle
Marathon Specialty Steels, Inc., New York, N. Y.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

WIRE—Nickel Alloy
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wisconsin Wire Works, Appleton, Wis.

WIRE—Nickel Silver and Phosphor Bronze
Malin & Co., The, Cleveland, Ohio
Wisconsin Wire Works, Appleton, Wis.

WIRE—Oil Tempered
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Malin & Co., The, Cleveland, Ohio
Pan American Trade Development Corp., New York, N. Y.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Special Shapes
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Spring
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Keystone Steel & Wire Co., Peoria, Ill.
Marathon Specialty Steels, Inc., N. Y., N. Y.
Pan American Trade Development Corp., New York, N. Y.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Wisconsin Wire Works, Appleton, Wis.

WIRE—Stainless Steel
American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Jones & Laughlin Steel Corp., Stainless and Strip Div., Detroit, Mich.
Malin & Co., The, Cleveland, Ohio
Nippon Stainless Steel Wire Mfg. Co., Ltd., Osaka, Japan
Pan American Trade Development Corp., New York, N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wisconsin Wire Works, Appleton, Wis.

WIRE—Steel—Also Coppered and Galvanized Steel
American Steel & Wire Div., United States Steel Corp., Cleveland, Ohio
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Detroit Steel Corporation, Detroit, Mich.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Malin & Co., The, Cleveland, Ohio
Pan American Trade Development Corp., New York, N. Y.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A. Sons Div., Colorado Fuel & Iron Corp., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

WIRE—Straightening and Cutting
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Wisconsin Wire Works, Appleton, Wis.

WIRE—Upholstery and Mattress
Pan American Trade Development Corp., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

WOOD—for Guide Rolls, Bushings, Wear Parts, etc.
American Wood Working Co., Montello, Wisc.

WRAPPING PAPER—Creped
(See PAPER—Creped Wrapping)

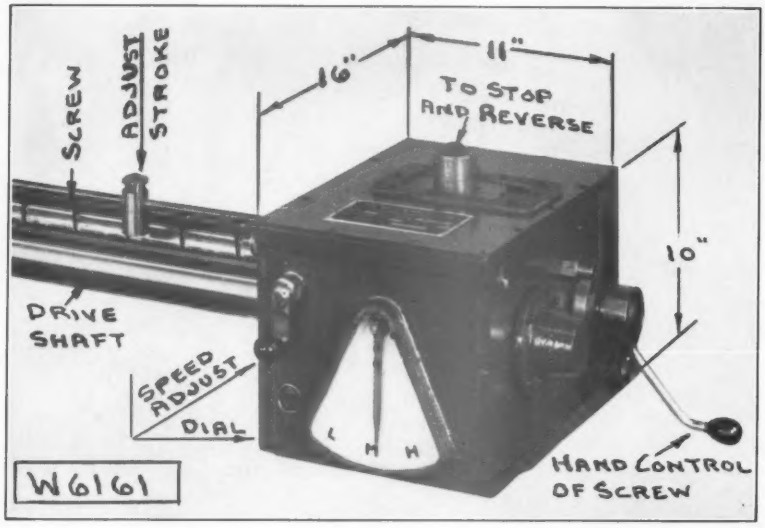
YARN TESTERS—
National Standard Electronics, Inc., New York, N.Y.
Scott Testers, Inc., Providence, R. I.

YARNS—Wire Insulating
Chadwick Yarn Company, Pawtucket, R. I.
Synthetic Thread Co., Bethlehem, Pa.

The WATSON MACHINE COMPANY
ESTABLISHED 1845
PATERSON 16, NEW JERSEY, U. S. A.
ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

WATSON

ADJUSTABLE - SPEED REDUCTION "V" HAVING AUTOMATIC REVERSE & ADJUSTABLE STROKE



U.S. Patent
2,898,770

PRIMARILY INTENDED FOR "THREAD-LAYING" ON REELS, IT LENDS ITSELF TO APPLICATIONS WHERE "ADJUSTABLE STROKE & SPEED" MOVEMENT ARE REQUIRED.

STANDARD UNIT ASSEMBLES WITH SHAFT AND SCREW AT RIGHT OR LEFT.

10 TO 1 STEPLESS SPEED VARIATION WITH INDICATING DIAL OVER 1/5.5 TO 1/55 SPEED DROP THROUGH REDUCTION.

"STROKE" AND "SPEED" ADJUSTMENTS, AND "TRANSFER FROM POWER TO MANUAL DRIVE OF SCREW" ARE ACCOMPLISHED WHILE OPERATING.

300-INCH-POUND OUTPUT TORQUE AT 300-RPM INPUT SPEED
TO
600-INCH-POUND OUTPUT TORQUE AT 150-RPM INPUT SPEED.

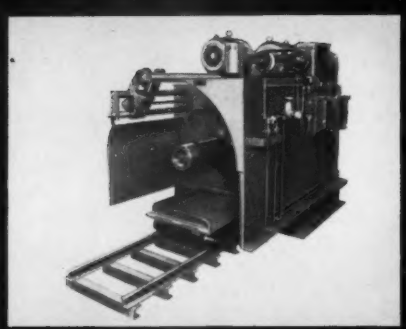
AUXILIARY MOTORED DRIVE AVAILABLE TO ADVANCE OR RETARD MOVEMENT FROM REMOTE POINT.

SLIDE WITH SCREW AND SHAFT AVAILABLE TO MEET CONDITIONS.

"better machinery for the wire industry"...

is a Syncro by-word... Producing it is a Syncro art. Syncro Machine Company's complete line of wire drawing and cable mill equipment represents 30 years of wire industry leadership. With a creative engineering eye focused on the future, Syncro will continue to fill the industry's demand —greater speed, efficiency, and profit through automation.

Our engineers welcome the opportunity to give you further information on how SYNCRO can help meet your plant's wire and cable production requirements. Write Syncro Machine Company, Dept. C, Perth Amboy, New Jersey.



Syncro Model T-2 Spooler—Accommodating up to two ton spools at maximum operating speeds.

affiliated company. Winget Syncro Ltd., Rochester, Kent, England.

SYNCRO®

wire drawing machines • stranders • continuous electric annealers • payoffs, capstans, wire insulators • heavy duty takeups • tapers • special machinery.

inery.